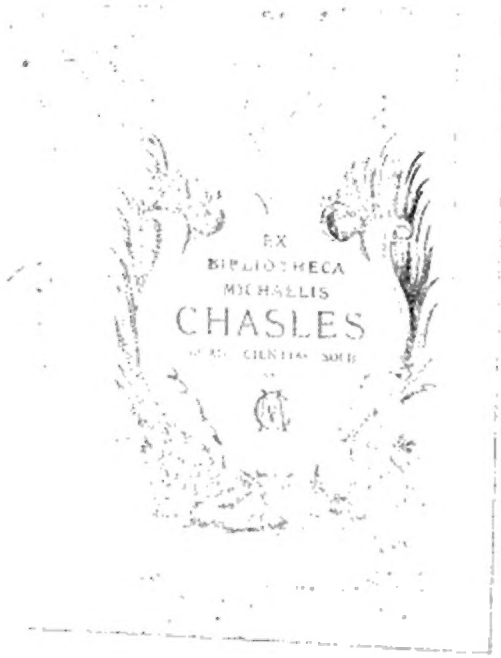
201
41 H
6



Digitized by Google

A la disposition de Monsr Le Colonel Beaucourt

President de L'Union des Ingenieurs Civils de l'Ecole Centrale

à Paris

The Acceptance of a Copy of

Colonel Beaufoy's

Nautical and Hydraulic Experiments.

First Volume,

is most respectfully solicited by the Publisher.

"For never any thing can be amiss
When simpleneſs and duty tender it."
SHAKESPEAR.

The Second and Third Volumes will be duly forwarded as soon as printed.

Henry Beaufoy.

South Lambeth, London.
May 1st 1831.

A Monsieur Legrand Directeur Général des ponts et chaussées

Le Colonel Beaucourt.

Digitized by Google

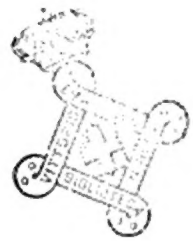
NAUTICAL

AND

HYDRAULIC EXPERIMENTS,

&c. &c. &c.

Digitized by Google



Digitized by Google

Digitized by Google

Digitized by Google

NAUTICAL

AND

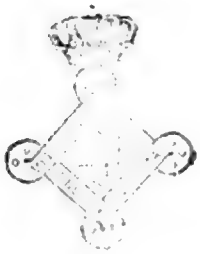
HYDRAULIC EXPERIMENTS,

WITH NUMEROUS

SCIENTIFIC MISCELLANIES.

BY

COLONEL MARK BEAUFOY, F.R.S. &c.



Experience is by industry atchiev'd,
And perfected by the swift course of time.
SHAKESPEARE.

IN THREE VOLUMES, WITH PLATES.

VOL. I.

LONDON:

PRINTED AT THE PRIVATE PRESS OF HENRY BEAUFOY, F.R.S. SOUTH LAMBETH, SURREY.
UNDER THE SUPERINTENDENCE OF JAMES SPARROW, PRINTER, SOUTH LAMBETH.

Published May 1834.

N.B. To secure a safe delivery of the Work to the respective Parties to whom Copies are presented, each Copy will be numbered at the back of the Title-page, and a List of the Appropriation of the whole Impression will be printed in both the SECOND and THIRD VOLUMES.

No. 826.

Digitized by Google

TO

THE RIGHT HONOURABLE

HENRY LORD BROUGHAM AND VAUX,

LORD HIGH CHANCELLOR OF GREAT BRITAIN,

&c. &c. &c.

THIS WORK IS DEDICATED,

AT THE EXPRESS DESIRE OF THE AUTHOR,

THE LATE

COLONEL MARK BEAUFOY, F.R.S. &c.

IN TESTIMONY OF THE AUTHOR'S

VENERATION FOR YOUR LORDSHIP'S TRANSCENDENT EXERTIONS

IN THE CAUSE OF THE PEOPLE,

BY THE PROMOTION OF UNIVERSAL EDUCATION,

AND

THE GENERAL DIFFUSION OF USEFUL KNOWLEDGE,

BY, MY LORD,

YOUR LORDSHIP'S OBEDIENT SERVANT,

South Lambeth, London,
June 1, 1833.

HENRY BEAUFOY.

Digitized by Google

CONTENTS

OF THE FIRST VOLUME.

Page.

PREFACE vii

TABLE I. Pendulum Experiments, made to ascertain the comparative resistances which different solids, constructed upon the same base and perpendicular, meet with in moving through a fluid... xii

——— II. Pendulum experiments with the broad sides of the bodies foremost xv

——— III. Pendulum experiments, made with a view of determining what form must be given to a solid to enable it to move through water with the smallest possible resistance xvii

——— IV. Some of the solids tried broad-side foremost..... xxi

——— V. Pendulum experiments, made with solids of the same breadth as those in the two preceding Tables, but of a greater length xxiii

POSTSCRIPT TO THE PREFACE..... xxxiii

INTRODUCTION TO THE FIRST SERIES OF EXPERIMENTS xxxvii

CHAP. I. Definitions and explanatory observations xxxix

——— II. On the experiments made in the year 1795..... xli

——— III. On the experiments made with the bodies mbm and pbp..... xliii

——— IV. On the difference of resistance and friction near the surface and at the mean depth of six feet xliv

——— V. On the difficulties and obstructions experienced in conducting the early experiments xlvi

——— VI. On the experiments made in the year 1796..... xlviii

——— VII. Further remarks on the experiments made in 1796 xlix

——— VIII. On the experiments made in the year 1797..... l

——— IX. Some of the experiments in 1797 compared..... liii

——— X. Concerning the experiments made in the year 1798..... liv

——— XI. On the law of the minus pressure..... lv

——— XII. On the law of the plus pressure..... lvi

——— XIII. On the advantages of curved lines..... lviii

——— XIV. On the finding the plus and minus pressures..... lix

——— XV. Examination of the general law of the experiments and the method of calculating..... lxiii

——— XVI. Description of the apparatus lxvi

THE REPORT MADE TO THE SOCIETY lxxi

CHAP. I. Explanatory observations..... lxxiv

——— II. Examination of the experimented velocities, to search out the law of resistance which belongs to the different bodies..... lxxv

——— III. On the finding of the friction lxxviii

CHAP. IV. On the resistance sustained by the different bodies when considered as ships or navigable vessels, with comparative observations relative to the advantages or disadvantages arising from the form, with respect to the relation which the resistance bears to the capacity, and to the stability or power of carrying sail, and also to the *vis insita* force..... lxxix

Page.

TABLE V. On the finding the plus and minus pressures (together and separately) of the different bodies respectively, with comparative observations respecting the law of the plus pressure against direct and oblique surfaces lxxxv

——— VI. Tables of the law, or indexes of the power of the velocity, by which the total resistance—the friction—the plus pressure—and the minus pressure of the different bodies respectively increase or decrease, with observations thereon;—TABLES I. to IV. lxxxviii

——— VII. Comparative observations, respecting the resistance of the isosceles triangle—the cube—the square plane—the round plane—the cylinder—the globe, &c., as used in the experiments of the year 1797, wherein the effect of the deflection of the water on the minus pressure is exemplified, with comparisons relative to the accuracy of the experiments xci

——— VIII. Comparative observations respecting the resistance arising from the friction of the water xciv

Conclusion of the Report made to the Society, with the following eight Tables :— civ

TABLE I. *Part I.* References to the form and dimensions of the bodies tried in 1798.

——— I. *Part II.* Ibid.

——— I. *Part III.* References to the form and dimensions of the bodies tried in 1797.

——— I. *Part IV.* ——————————————— in 1796.

——— II. *On Friction.* Showing the motive powers requisite to overcome the resistance arising from the friction alone of the water against the several surfaces of the different bodies tried in the years 1798, 1797, and 1796, respectively :—and also the square feet and decimal parts of square feet which are contained in the said surfaces of the said bodies respectively.

——— III. *Part I.* Analysis of the total resistance of the different bodies respectively :—Showing at one view the motive power which is requisite to overcome the various resistances of the different bodies tried in the year 1798 as applicable to practice.

——— III. *Part II.* Ibid.

——— III. *Part III.* Analysis of the total resistance of the different bodies respectively, &c. tried in the year 1796.

EXPLANATION OF THE TABLES cv

NOTES ON THE CONSTRUCTION AND APPLICATION OF THE TABLES cviii

TABLE OF ERRATA AND OF CORRECTED READINGS cxi

THE FIRST SERIES OF EXPERIMENTS.

NAMES OF THE DIFFERENT SOLIDS TRIED IN 1793.

Page.

Parallelopipedon A 1

——————— B 7

——————— A on its edge, called C 11

——————— A lengthened, by adding a semicircular end to each extremity, called E 19

Triangle F, dividing the water with its base 25

——— F, dividing the water with its vertex 33

Parallelopipedon with a triangle joined to its base, called H, drawn through the water by its base 38

The same figure drawn through the water by its vertex 43

A General Table of the Bodies tried in 1793 47

NAMES OF THE DIFFERENT SOLIDS TRIED IN 1794.

Page.

Parallelopipedon D 48
——— D, on its edge, called E. 51
——— D lengthened, by adding a semicircular end to each extremity, called F. 55
Isosceles triangle, called K, drawn through the water by its base. 59
The same figure drawn through the water by its vertex 62
Compound figure H, having the parallelopiped end formed into a semi-ellipsis, called P, drawn through the water by its elliptical end 67
Compound figure H, having the parallelopiped end reduced to two segments of a circle, called Q, drawn through the water by its circular end 70
A General Table of the Bodies tried in 1794 73

NAMES OF THE DIFFERENT SOLIDS TRIED IN 1795.

Parallelopipedon a 74
——— b 81
——— b, lengthened by adding a semi-ellipsis to its hindmost extremity, called c 87
——— b, lengthened by adding a semi-ellipsis to its foremost extremity, called d. 93
——— b, lengthened by adding a semi-ellipsis to each extremity, called e. 100
——— b, lengthened by having a circular wedge added to its hindmost extremity, called f. 106
——— b, lengthened by having a circular wedge added to its foremost extremity, called g 112
——— b, lengthened by having a circular wedge added to each extremity, called h 118
——— a, lengthened by having a circular wedge added to each extremity, called i. 124
——— b, lengthened by having an angular wedge added to its hindmost extremity, called k 129
——— b, lengthened by having an angular wedge added to its foremost extremity, called l 134
——— b, lengthened by having an angular wedge added to each extremity, called m 139
——— b, lengthened by having an inclined plane added to its hindmost extremity, called n 145
——— b, lengthened by having an inclined plane added to its foremost extremity, called o 151
——— b, lengthened by having an inclined plane added to each extremity, called p 155
——— a, lengthened by having an inclined plane added to each extremity, called q 159
Isosceles Triangle r drawn through the water by its base 163
——— r drawn through the water by its vertex, called s. 167
——— t drawn through the water by its base 170
——— t drawn through the water by its vertex, called u 175
——— v drawn through the water by its base 180
——— v drawn through the water by its vertex foremost. 183

Experiments made below the Surface of the Water.

Parallelopipedon p, with parallelopipedon b attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet 187
——— p, with the body k attached, &c. 192
——— p, with the body l attached, &c. 201
——— p, with the body m attached, &c. 209
——— p, with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet. 217

Page.

Parallelopipedon p, with parallelopipedon b, lengthened by a wedge at each extremity, called x, immersed six feet 225
——————— p, with the bars alone, the lower body being taken away 231
——————— p, with a smooth painted deal plank attached to the bars, immersed six feet, the foremost end of the plank in the shape of an equilateral triangle 239
——————— p, with 1 foot and ¼ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away, for ascertaining the friction of the water on a surface of 50 feet 245

Experiments made to ascertain the Resistance of Water at different Depths.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane, containing 2.9718 superficial feet, and the centre of the plane was immersed three feet 252
——————— p, with the same plane immersed six feet 258
——————— p, with the same plane immersed nine feet 267
——————— p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 2 feet 4.686 inches 280
——————— p, &c. the iron bar immersed 5 feet 4.686 inches 286
——————— p, &c. the iron bar immersed 8 feet 4.686 inches 295

Experiments made for ascertaining the Resistance of a Plane when placed obliquely to the Shock of running Water.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed 3 feet below the surface of the water, with the planes *outwards* or *from* the conducting figure 300
——————— i, the same planes immersed 3 feet, &c. turned *inwards* or *to* the conducting figure 312
——————— i, with the bars alone, the planes being taken away; the bars being immersed three feet below the surface of the water 319
A General Table of the Experiments of 1795 *at the Surface* 322
A General Table of the Experiments of 1795 *under the Surface* 323
A Table containing the Diminution of the Plus and Minus Pressures at the Surface in the Experiments of 1795 324

THE SECOND SERIES OF EXPERIMENTS.

NAMES OF THE DIFFERENT SOLIDS TRIED IN 1796.

Conductor with angular bars, immersed five feet six inches 325
Conductor with parallelopipedon P, with the ends Aa, the centre of lower body immersed six feet 334
——————————— P, with A fore and l after bodies immersed six feet 342
——————————— P, with A fore and k after bodies ——————— 345
——————————— P, with A fore and e after bodies ——————— 349
——————————— P, with A fore and i after bodies ——————— 356
——————————— P, with E fore and a after bodies ——————— 361
——————————— P, with K fore and a after bodies ——————— 371
——————————— P, with L fore and a after bodies ——————— 376
——————————— P, with I fore and a after bodies ——————— 381
——————————— P, with I fore and i after bodies ——————— 392
Conductor, with the long friction plank, the centre being immersed six feet 397
——————— short friction plank, ——————————— 405
A General Table of the Bodies tried in 1796 412

NAMES OF THE DIFFERENT SOLIDS TRIED IN 1797

Page.
Conductor, with round iron bar, immersed five feet six inches ... 413
——— and triangle M, vertex foremost, the centre of the triangle being immersed six feet 421
——— and the same figure with base foremost, immersed six feet ... 425
——— and cube R, immersed six feet ... 430
——— and square plane S, immersed six feet ... 437
——— and round plane T, immersed six feet ... 445
——— and cylinder U, immersed six feet ... 452
Conductor, round bar, and cylinder, with a semi-globe after body called W, immersed six feet ... 459
——— with a semi-globe fore body called X ——— ... 463
——— with semi-globe fore and after bodies called Y, immersed six feet ... 468
Conductor, round bar, and globe called Z, immersed six feet ... 474
A General Table of the Experiments in 1797 ... 481

NAMES OF THE DIFFERENT SOLIDS TRIED IN 1798.

New Conductor and broad bar n, immersed 5 feet 6 inches ... 482
New Conductor, broad bar, and friction plank, immersed six feet ... 487
New Conductor, broad bar, and short friction plank, immersed six feet ... 499
New Conductor, broad bar, and body A o immersed six feet ... 509
——— A a ——— ... 514
——— A b ——— ... 521
——— A c ——— ... 526
——— A d ——— ... 532
——— A e ——— ... 537
——— A f ——— ... 543
——— A g ——— ... 549
——— A h ——— ... 555
——— A i ——— ... 563
——— B a ——— ... 569
——— C a ——— ... 574
——— D a ——— ... 580
——— E a ——— ... 586
——— F a ——— ... 592
——— G a ——— ... 598
——— H a ——— ... 603
——— H o ——— ... 610
——— I a ——— ... 617
——— I o ——— ... 628
——— H i ——— ... 635
——— i H ——— ... 642
——— H ——— ... 650
New Conductor, broad bar and cylinder L ——— ... 657
New Conductor, broad bar, and body a L ——— ... 665

Page.

New Conductor, broad bar, and body L a immersed six feet 673

——————————————a L a—————————— 681

A General Table of the Experiments in 1798 688

DIRECTIONS TO THE BINDER.

The PROFILE to be placed opposite the Title.

The VIGNETTE of the Nautilus, &c. (Sig. A^2) to be inserted next to p. vi. of the Contents.

PLATES I. to V. to be inserted after the Description of the Apparatus at p. lxx.

The INDEX (PLATES VI. to XVI. inclusive), to be placed at p. 688.

The Eight folding Tables to be placed in the following order at page civ.:—

TABLE I. *Part I.* References, &c.
——— I. *Part II.* ——————
——— I. *Part III.* ——————
——— I. *Part IV.* ——————
——— II. *On Friction.*
——— III. *Part I.* Analysis, &c.
——— III. *Part II.* ——————
——— III. *Part III.* ——————

N.B. The signature or folio of the additional and cancelled sheets or pages have this mark ♀ at the bottom of the page to distinguish them.

Digitized by Google

The art itself is Nature. SHAKESPEARE.

Art is but Nature better understood. POPE.

PREFACE.

EXPERIMENTS derive their value from the care and skill with which they are conducted. When accurately made and honestly recorded they present a basis for calculation founded upon facts; and fundamental truths once satisfactorily established by actual experiment, the mathematician can proceed with confidence to fix the elements of the theory.

The art of experimenting correctly is a science to be attained only by long practice, by which defects are developed and remedies suggested. This experience constitutes the happy tact indispensable for rendering the results sufficiently accurate to be practically useful.

It is fortunate when a peculiar turn of mind, conjoined with patient industry, a scrupulous regard for truth, and absence from prejudice, are found united in the individual who undertakes to investigate a complex question by the severe test of experiment. But these advantages are greatly enhanced when an ardent love of the subject, assisted by early scientific education, have paved the way to eminence, by surmounting in childhood the difficulties of preparatory study.

Colonel BEAUFOY had made his first experiments upon the Resistance of Solids moving through

Water, before he was fifteen years of age; and he pursued the subject, with unabated zeal, until within a few months of his death. His attention was first drawn to the subject in consequence of his hearing stated one evening by an eminent mathematician, as an axiom generally received by naval mechanics, that "*a cone drawn through the water with its base foremost, experienced "less resistance from the fluid than with its apex foremost.*"

This paradoxical assertion excited young BEAUFOY's curiosity, and before bed-time, with the assistance of a neighbouring turner, he ascertained the fallacy of the alledged opinion, by making the experiment in one of the coolers in his father's brewhouse, the large bunch of counting-house keys being put in requisition for a motive power.

The impetus was thus given. This experiment was the precursor to many others: in the course of which, he ascertained that the method of determining the resistance by drawing the bodies in an horizontal direction with a weight over a small pulley, and then measuring the space moved over with a watch, was ill adapted for experiments upon a small scale, owing to the impossibility of telling when the uniform motion of the body passing through the water commences.

Baffled in this first attempt, and having frequently observed on what uncertain grounds ship-wrights in general have founded their different and variable rules for the construction of vessels, he was desirous of making a set of experiments that might, if possible, reduce their art to fixed and determined principles.

It is well known, that ever since Navigation has been brought to any degree of perfection, the most eminent ship-wrights, as well as mathematicians, have endeavoured to ascertain in what part of the vessel the greatest breadth should be placed; but from the want of proper experiments, and the consequent imperfection of theory, this important and long-wished-for circumstance has never been thoroughly ascertained.

From this consideration, and from the persuasion that every undertaking which has for its object the improvement of naval mechanics will be indulgently received, it will be interesting to lay before the reader two sets of experiments made with a pendulum "*On the Resistance of "Solids moving through Water,*" as indicating the progress by which Colonel BEAUFOY became qualified for making the Experiments at Greenland Dock.

His First Series of Pendulum Experiments are entitled, "*Experiments to ascertain the com-"parative Resistance which different Solids, constructed upon the same Base and Perpendicular, "meet with in moving through a Fluid.*"

The apparatus consisted of a wooden vessel seven feet long, one foot broad, and twenty inches deep. In this vessel, when filled with water, was immersed the lower part of a pendulum to a given depth below the surface. The pendulum, five feet and a half long, was supported upon two small steel pivots fitted into two brass sockets. The bob of the pendulum was placed twelve inches from the lower extremity of a strong steel wire firmly fitted into the end of the pendulum-rod.

At the bottom of the wire was a conical screw for the purpose of successively attaching to the pendulum the different solids on which experiments were intended to be made. This screw was one inch in length, and was furnished with a shoulder, which prevented all danger of one solid being fixed differently from another.

There were three bobs fitted to the pendulum, by which a greater or less momentum could be given when found necessary.

To the pendulum thus prepared was affixed a bob, the lower extremity of which was even with the surface of the water. At first, the pendulum was suspended with a piece of watch-spring, in the same manner as the pendulum of a common clock, but the tension of the spring not being uniform, it communicated a wabbling motion to the pendulum when describing large arcs. This was partially remedied by substituting a double spring. But the suspension, by means of the two pivots fitted on to the brass sockets, was found to answer best.

The first set of Experiments was rejected, in consequence of its being discovered that when the resistance of the solids was considerable, the lower part of the pendulum-rod yielded to the pressure and bent, which caused an error in reading off the Experiments. This was obviated by adding two braces leading from the extremity of the wire above the screw, and rivetted to each side of the bob.

Upon the trough was placed, lengthwise, a scale of inches and tenths of inches. The extremities of the scale rested on the two ends of the trough, and the centre of the scale coincided with the centre of the pendulum when it hung in a vertical direction.

To the bob of the pendulum was fastened a string which, passing over a pulley raised on a piece of wood at one end of the trough, drew the pendulum from the centre of the trough towards one of its extremities. When it was intended that the pendulum should begin to oscillate, it was drawn aside to a chord of thirty-four inches, and was marked by a piece of catgut strained

across the trough; when the pendulum was brought to its proper place, the string which drew it was fastened to a peg behind the pulley at the extremity of the trough, and then allowed to remain until all was perfectly motionless. The pendulum being brought to its place, the solid on which the experiment was intended to be made was screwed to the rod. A carpenter's square was laid on the trough at right angles to the scale, and over that division of it to which it was supposed the pendulum would oscillate.

The string being then burnt with a candle by an assistant, the observer noted by the scale the ascending arcs which the pendulum described, when the different solids were affixed to it. Having in this manner ascertained the ascending chords formed by the different solids, and calculated the correspondent angles, it was easy to determine the comparative degrees of resistance with which the different solids moved through the water: for nothing remained but to reduce the angle belonging to each solid into tenths of seconds, and to find the proportion which they bore to each other.

By this means the comparative resistances were determined, presuming those bodies to have the least resistance with which the pendulum described the largest arcs, and *vice versâ*. The solids used in this Series of Experiments were made of mahogany, and were two inches in diameter and two inches in length. This size was preferred, as being thought sufficiently large for trying the experiment, and at the same time space enough was left to allow of the free divergence of the water in the vessel.

The several bodies were reduced as nearly as possible to the same specific gravity by plugging the wood with lead; and to equalize the friction their surfaces were varnished.

This Series comprised a great variety of figures and of impulses: but Colonel Beaufoy held none of the Pendulum Experiments in any estimation, further than as shewing the comparative resistance of the various figures tried under similar circumstances.

His Second Series of Pendulum Experiments are entitled, "*Experiments made with a View of "determining what Form must be given to a Solid to enable it to move through Water with the smallest "possible Resistance.*"

In these latter Experiments improvements were made in the apparatus, and the length of the pendulum, as well as the size of the bodies, increased. The trough remained as in the former Series. The rod of the pendulum was 97.10 inches in length, $\frac{6}{10}$ of an inch in breadth, and $\frac{3}{10}$ of

an inch in thickness. These were the general proportions of the rod, but nine inches and $\frac{70}{100}$ of an inch of its lower extremity were rounded off, and this part was immersed in water. The place of the pendulum when drawn aside was always thirty-seven inches on the scale.

The solids with which this set of Experiments was made were all of beech, and were four inches in length and two in breadth. Their weights, when immersed in water, were reduced to an equality by the wood being loaded with shot, which was made hollow for that purpose. The difference in the weights of the solids was indeed too small to produce any sensible error, for it did not exceed four grains; and it was ascertained by repeated trials, that a difference of less than twelve pennyweights produced no sensible alteration in the ascending chord. The string which held the pendulum was cut with a sharp pair of scissors, this method being found preferable to burning. If the pendulum did not reach the square, or if it struck with force against it, the square was moved, and the Experiment repeated, till the stroke was just perceptible to the ear.

An account was then taken of the division on the scale which the edge of the square marked out, and which, after subtracting the semi-diameter of the rod, viz. .15, determined the true ascending chord.

The annexed Tables of the Pendulum Experiments have been constructed since Colonel Beaufoy's decease, from the rough memoranda of the Experiments noted down by him at the time. The editor has endeavoured to attain accuracy, but due allowance must be made by the reader should any error be detected for the want of the author's correction and assistance to explain.

This remark applies only to the Pendulum Experiments contained in the preface, for the Experiments at Greenland Dock are printed verbatim from Colonel Beaufoy's manuscript, as prepared by him for the press.

EXPERIMENTS

MADE TO ASCERTAIN THE COMPARATIVE RESISTANCES WHICH DIFFERENT SOLIDS, CONSTRUCTED UPON THE SAME BASE AND PERPENDICULAR, MEET WITH IN MOVING THROUGH A FLUID.

TABLE I.

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
1	Pendulum	27.85	27	39	04
2	Sir Isaac Newton's solid of the least resistance, with the middle made triangular, or rather it was a circular spindle, there being no sensible difference between one solid and the other on so small a scale	27.18	27	05	03
3	Circular spindle whose fore-part was 2 inches and whose after-part was 4 inches; in other words, it was $\frac{1}{3}$ longer than the other solids	27.10	27	00	57
4	Long part foremost	27.00	26	55	49
5	Solid composed of segments of circles	27.03	26	57	42
6	Elliptical spindle, with the top and bottom made triangular	27.01	26	56	20
7	Newton's solid of the least resistance	27.00	26	55	49
8	Newton's ditto with the top and bottom rounding outwards	27.00	26	55	49
9	Oval	26.98	26	54	47
10	Newton's solid, or rather a circular spindle brought to a point	26.95	26	53	15
11	Newton's ditto, with the top and bottom rounding inwards	26.95	26	53	15
12	Double triangular circular pyramid	26.95	26	53	15
13	Double catenarian whose height is equal to the other's breadth, and whose breadth is equal to double the other's height	26.25	26	17	02
14	Newton's solid, with a cylinder added to the middle	26.93	26	52	15
15	Circular double hexagon pyramid	26.90	26	50	40
16	Two segments of a circle cut longitudinally	26.90	26	50	40
17	Two segments of a circle divided into $\frac{1}{3}$ and $\frac{2}{3}$	26.88	26	49	39
18	Ditto $\frac{2}{3}$ foremost	26.34	26	21	43
19	Newton's solid divided into $\frac{1}{3}$ and $\frac{2}{3}$	26.86	26	48	37
20	Ditto $\frac{2}{3}$ foremost	26.78	26	44	30
21	Two segments of a circle	26.80	26	45	31
22	Ditto divided into $\frac{1}{10}$ and $\frac{9}{10}$	26.80	26	45	31
23	Ditto $\frac{9}{10}$ foremost	26.35	26	22	14
24	Ditto divided into $\frac{1}{3}$ and $\frac{2}{3}$	26.78	26	44	30
25	Ditto $\frac{2}{3}$ foremost	26.00	26	04	01

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
26	Double parabola	26.70	26	40	22
27	Ditto whose breadth was 4 inches and height 2 inches	26.70	26	40	22
28	Ellipsis.	26.63	26	36	14
29	Ellipsis, with a cylinder added to the middle	26.57	26	33	38
30	Two parabolas divided into $\frac{1}{2}$ and $\frac{1}{2}$	26.48	26	28	59
31	Ditto $\frac{1}{2}$ foremost	24.90	25	06	08
32	Semi-ellipsis cut vertically, with half of two segments of a circle joined to the flat end	26.40	26	24	50
33	Ditto circular part foremost	26.34	26	21	43
34	Half of two segments of a circle with a cylinder joined to the flat end	26.34	26	21	43
35	Ditto cylindrical part foremost	22.20	22	40	10
36	Catenarian fluted with 16 flutes	26.30	26	19	40
37	A very obtuse oval	26.05	26	06	37
38	Cycloid	26.00	26	04	01
39	Cylinder with a semi-ellipsis joined to one end	25.95	26	01	24
40	Ditto cylindrical part foremost	22.10	22	34	40
41	The same solid fluted with 12 flutes	25.95	26	01	24
42	Ditto cylindrical part foremost	22.30	22	45	40
43	Catenarian	25.93	26	00	22
44	Semi-ellipsis with a semi-globe joined to the flat end	25.90	25	58	48
45	Ditto globular part foremost	24.60	24	50	11
46	Cylinder with a semi-globe at each end	25.80	25	53	34
47	Half of two segments of a circle with a cone affixed to the flat end	25.60	25	43	05
48	Ditto conical part foremost	25.12	25	17	47
49	Solid of the least resistance according to Emerson	25.50	25	37	50
50	Epicycloid	25.50	25	37	50
51	Semi-globe	25.50	25	37	50
52	Ditto convex side foremost	24.00	24	18	06
53	Ditto plain side foremost	18.50	19	11	29
54	Ditto circular side foremost	20.00	20	37	15
55	Ditto plane side	15.50	16	15	29
56	Two segments of a circle, half of the curve concave, the other half convex	25.47	25	36	15
57	Ditto convex part foremost	21.25	21	47	31
58	Emerson's solid divided into $\frac{1}{2}$ and $\frac{1}{2}$	25.40	25	32	34
59	Ditto $\frac{1}{2}$ foremost	25.10	25	16	44
60	Two-thirds of two segments of a circle	25.40	25	32	34
61	Ditto flat end foremost	20.00	20	37	15

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
62	A very acute oval	25.31	25	27	49
63	Sphere	25.27	25	25	42
64	Half of two segments of a circle with a semi-globe joined to the flat end?	25.25	25	24	39
65	Ditto globular part foremost?	25.10	25	16	44
66	Cylinder with a semi-globe joined at one end	25.22	25	22	54
67	Ditto square end foremost	22.17	22	38	31
68	Half of two segments of a circle	25.05	25	14	05
69	Ditto flat end foremost	19.00	19	40	13
70	Circular double wedge	24.90	25	06	08
71	Cone, whose altitude was 4 inches	24.75	24	58	10
72	Ditto base foremost	20.10	20	42	55
73	Parabola	24.65	24	52	51
74	Ditto base foremost	19.20	19	51	42
75	A frustrum of the least resistance	24.50	24	44	52
76	Ditto base foremost	19.62	20	15	40
77	Cone	24.37	24	37	55
78	Ditto base foremost	19.61	20	15	06
79	Cone before it was reduced to a frustrum	24.35	24	36	51
80	Ditto base foremost	19.60	20	14	32
81	Cone divided into ¼ and ¾	24.00	24	18	06
82	Ditto ¼ foremost	23.30	23	40	18
83	Double cone	23.97	24	16	29
84	Cone with a semi-globe joined to the base	23.60	23	56	33
85	Ditto globular part foremost	23.40	23	45	43
86	Triangle vertex foremost	22.62	23	03	14
87	Ditto base foremost	17.62	18	20	28
88	Double triangle	22.62	23	03	14
89	Double pyramid	22.05	22	31	54
90	Cylinder	22.00	22	29	08
91	Cylinder twice the length	22.00	22	29	08
92	Pyramid with its vertex foremost	21.72	22	13	39
93	Ditto base foremost	16.68	17	25	14
94	Cube	19.60	20	14	32
95	Cube diagonally	18.95	19	37	23

Digitized by Google

TABLE II.

THE BROAD SIDES FOREMOST.

Order in which the Experiments were made.	No. of the Experiments in TABLE I.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
			Inches.	°	′	″
1	79	Cone before it was reduced to a frustrum	23.97	24	16	29
2	34	Cone with a semi-globe joined to its base	23.90	24	12	48
3	75	A frustrum of least resistance	24.10	24	23	38
4	73	Parabola	23.10	23	29	16
5	77	Cone	22.95	23	21	16
6	50	Epicycloid	22.66	23	05	26
7	64	Half of two segments of a circle with a semi-globe joined to the flat end?	22.10	22	34	40
8	90	Cylinder	22.00	22	29	08
9	68	Half of two segments of a circle	21.70	22	12	32
10	81	Cone divided into $\frac{1}{3}$ and $\frac{2}{3}$	21.35	21	53	06
11	60	Two-*thirds* of two segments of a circle	21.22	21	45	51
12	71	Cone whose altitude was 4 inches	21.75	22	15	19
13	32	Pyramid with its vertex foremost	21.00	21	33	33
14	56	Two segments of a circle, $\frac{1}{2}$ of the curve concave, the other $\frac{1}{2}$ convex	20.65	21	13	56
15	44	Semi-ellipsis with a semi-globe joined to the flat end	20.20	20	48	34
16	83	Double cone	20.10	20	42	55
17	47	Half of two segments of a circle with a cone affixed to the flat end	20.10	20	42	55
18	49	Solid of the least resistance according to Emerson	20.00	20	37	15
19	21	Two segments of a circle	19.97	20	35	33
20	9	Oval	19.95	20	34	25
21	5	Solid composed of segments of circles	19.90	20	31	35
22	32	Semi-ellipsis cut vertically with half of two segments of a circle joined to the flat end	19.80	20	25	55
23	38	Cycloid	19.75	20	23	04
24	58	Emerson's solid divided into $\frac{1}{3}$ and $\frac{2}{3}$	19.70	20	20	13
25	66	Cylinder with a semi-globe joined at one end	19.65	20	17	23
26	46	Cylinder with a semi-globe at each end	19.59	20	13	58
27	28	Ellipsis	19.50	20	08	50
28	62	A very acute oval	19.50	20	08	50
29	13	Double catenarian, whose height is equal to the other's breadth and whose breadth is equal to double the other's height	19.30	19	57	25
30	36	Catenarian fluted with 16 flutes	19.20	19	51	42

Order in which the Experiments were made.	No. of the Experiments in Table I.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
			Inches.	°	′	″
31	43	Catenarian	19.10	19	46	00
32	19	Sir Isaac Newton's divided into $\frac{1}{3}$ and $\frac{2}{3}$	19.00	19	40	15
33	10	Newton's solid, or rather a circular spindle brought to a point	18.90	19	34	31
34	22	Two segments of a circle divided $\frac{5}{17}$ and $\frac{7}{17}$	18.90	19	34	31
35	34	Half of two segments of a circle with a cylinder joined to the flat end	18.80	19	28	46
36	37	A very obtuse oval	18.80	19	28	46
37	24	Two segments of a circle divided into $\frac{3}{5}$ and $\frac{2}{5}$	18.80	19	28	46
38	17	Two segments of a circle divided into $\frac{1}{4}$ and $\frac{3}{4}$	18.52	19	12	39
39	27	Double parabola whose breadth was 4 inches and height 2 inches	18.60	19	17	15
40	39	Cylinder with a semi-ellipsis joined to one end	18.30	18	59	56
41	30	Two parabolas divided into $\frac{1}{3}$ and $\frac{2}{3}$	18.20	18	54	09
42	41	Cylinder with a semi-ellipsis joined to one end fluted with 12 flutes	18.10	18	48	21
43	15	Circular double hexagon pyramid	18.00	18	42	33
44	91	Cylinder twice the length	17.80	18	30	56
45	26	Double parabola	17.80	18	30	56
46	8	Newton's solid of the least resistance, with the top and bottom rounding outwards	17.41	18	08	12
47	86	Triangle vertex foremost	17.10	17	50	04
48	2	Newton's solid of the least resistance with the middle made triangular, or rather a circular spindle, there being no sensible difference between one solid and the other on so small a scale	17.00	17	44	12
49	12	Double triangular circular pyramid	17.00	17	44	12
50	6	Elliptical spindle with the top and bottom made triangular	16.90	17	38	20
51	11	Newton's solid with the top and bottom rounding inwards	16.40	17	08	53
52	3	Circular spindle whose fore part was 2 inches and whose after was 4 inches, in other words it was $\frac{1}{7}$ longer than the other solids	16.21	16	57	39
53	70	Circular double wedge	15.00	15	45	36
54	88	Double triangle	14.90	15	39	36
55	29	Ellipsis with a cylinder added to the middle	14.50	15	15	34
56	14	Newton's solid with a cylinder added to the middle	14.40	15	9	33

EXPERIMENTS

MADE WITH A VIEW OF DETERMINING WHAT FORM MUST BE GIVEN TO A SOLID TO ENABLE IT TO MOVE THROUGH WATER WITH THE SMALLEST POSSIBLE RESISTANCE.

TABLE III.

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
1	Pendulum	32.50	20	23	52.2
2	Newton's solid with the top and bottom made triangular, or reduced to four flat sides	32.18	20	12	47.9
3	A double circular spindle, whose breadth is ⅓ from one end, and whose whole length was six inches	32.17	20	12	27.1
4	The preceding solid reversed, or the longest part foremost	31.46	19	47	47.6
5	A solid composed of segments of circles whose length was four inches and breadth 1.40 inches	32.11	20	10	22.4
6	Newton's solid reduced to four concave sides	32.07	20	8	51.1
7	An elliptical spindle reduced to four flat sides	31.97	20	5	31.1
8	A circular spindle cut longitudinally through its axis	31.95	20	4	49.5
	The same solid with the convex part foremost	25.00	15	57	45.8
	Ditto with the flat part foremost	19.70	12	42	8.0
9	A circular spindle whose length was equal to the figure in Experiment 3, viz. six inches	31.91	20	3	26.1
10	A circular spindle reduced to three flat sides	31.88	20	2	23.7
11	Newton's solid lengthened by the addition of a cylinder in the middle	31.75	19	57	52.8
12	A catenarian spindle fluted with 16 flutes	31.70	19	56	8.6
13	Newton's solid with its greatest breadth ⅓ from its end	31.65	19	54	24.3
14	The preceding solid reversed, or the longest part foremost	30.97	19	30	42.0
15	A double elliptical spindle whose greatest breadth is ⅓ from its end	31.65	19	54	20.3
16	The preceding solid reversed, or the longest part foremost	30.35	19	8	59.1
17	Newton's solid	31.60	19	52	40.0
18	A double circular spindle whose greatest breadth is ⅓ from its end	31.60	19	52	40.0
19	The preceding solid reversed, or the longest part foremost	30.26	19	5	49.5
20	Newton's solid continued out to a point	31.55	19	50	55.6
21	A double circular spindle whose greatest breadth is ⅓ from its end	31.55	19	50	55.6
22	The preceding solid reversed, or the longest part foremost	30.65	19	19	30.3
23	An elliptical spindle lengthened by the addition of a cylinder in the middle	31.47	19	48	8.5

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
24	A circular spindle reduced to six flat sides	31.45	19	47	26.7
25	An oval spindle	31.45	19	47	26.7
26	A double circular spindle whose greatest breadth is $\frac{1}{3}$ from its end	31.27	19	41	10.3
27	The preceding solid reversed, or its longest part foremost	30.67	19	20	12.2
28	A catenarian spindle	31.25	19	40	28.5
29	An elliptical spindle	31.40	19	35	14.5
30	A very obtuse oval spindle	31.07	19	34	11.6
31	A cylinder with a semi-sphere joined at each end	31.07	19	34	11.6
32	An elliptical spindle cut at right angles to its axis, and then a semi-globe joined to its base	31.07	19	34	11.6
33	The preceding solid reversed, or the elliptical part foremost	30.07	18	59	8.8
34	Half an elliptical spindle joined to half a circular spindle, each having been cut at right angles to its base	31.05	19	33	30.0
35	The preceding solid reversed, or the circular part foremost	31.00	19	31	44.9
36	A very acute oval spindle	30.98	19	31	3.0
37	A double parabolic spindle	30.95	19	30	0.0
38	A circular spindle	30.95	19	30	0.0
39	A double cone, lengthened by the addition of a cylinder in the middle	30.88	19	27	33.2
40	A catenarian spindle whose breadth is equal to the height of Experiment 28, and height equal to the breadth of Experiment 28	30.87	19	27	12.2
41	A cylinder with half an elliptical spindle joined to its end, and fluted with twelve flutes	30.76	19	23	21.4
42	The preceding solid reversed, or the cylindrical part foremost	28.60	18	7	10.9
43	Half a circular spindle with a semi-globe joined to its base	30.70	19	21	14.1
44	The preceding solid reversed, or the circular part foremost	29.52	18	39	46.0
45	A cylinder with a semi-globe joined to one of its ends	30.58	19	17	3.1
46	The preceding solid reversed, or the cylindrical part foremost	27.37	17	23	18.1
47	A cylinder, &c. the same as Experiment 41, but not fluted	30.57	19	16	42.1
48	The preceding solid reversed, or the cylindrical part foremost	27.66	17	33	40.9
49	A cylinder with half a circular spindle joined to one of its ends	30.57	19	16	42.1
50	The preceding solid reversed, or the cylindrical part foremost	27.70	17	35	6.6
51	A semi-sphere	30.57	19	16	42.1
	Convex side	28.60	18	7	10.9
	Flat side	24.10	15	24	57.1
52	A cycloidal spindle	30.47	19	13	11.8
53	A cone with half a circular spindle joined to its base	30.38	19	10	2.2
54	The preceding solid reversed, or the circular part foremost	29.63	18	43	39.1

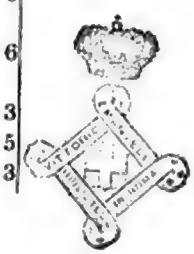
Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
55	A double parabolic spindle whose greatest breadth is ⅓ from its ends	30.38	19	10	2.3
56	The preceding solid reversed, or the longest part foremost	29.30	18	31	59.6
57	A double parabolic spindle, whose breadth is equal to the height of Experiment 37, and height is equal to the breadth of Experiment 37	30.27	19	6	10.6
58	An epicycloidal spindle	30.00	18	56	41.1
59	Half a circular spindle, whose breadth is two inches, and length ¾ of four inches	29.90	18	53	9.9
60	The preceding solid reversed, the base foremost	24.71	15	47	12.5
61	The halves of two circular spindles, joined at their bases, the one concave and the other convex	29.76	18	48	14.0
62	The preceding solid reversed, or the concave part foremost	26.37	16	47	21.8
63	A solid of the least resistance according to Emerson, its greatest breadth ⅓ from its end	29.58	18	41	53.1
64	The preceding solid reversed, or the longest part foremost	29.05	18	23	8.7
65	A parabolic spindle	29.57	18	41	31.8
66	The preceding solid reversed, or the base foremost	25.61	16	19	54.0
67	A solid of the least resistance according to Emerson	29.55	18	40	49.6
68	A cone whose altitude is four inches	29.55	18	40	49.6
69	The preceding solid reversed, or the base foremost	24.61	15	43	33.9
70	A circular spindle cut vertically, or half a circular spindle	29.50	18	39	3.6
71	The preceding solid reversed, or base foremost	24.00	15	21	17.7
72	Two segments of a cylinder joined, that is a circular double wedge	29.37	18	34	28.1
73	A frustrum of a cone of the least resistance	29.07	18	23	51.1
74	The preceding solid reversed, or the base foremost	24.67	15	45	45.1
75	A cone before it was reduced to a frustrum of the least resistance	29.02	18	22	5.0
76	The preceding solid reversed, or the base foremost	24.35	15	34	5.0
77	A sphere	29.00	18	21	22.5
78	A cone	28.90	18	17	49.8
79	The preceding solid reversed, or the base foremost	24.89	15	53	45.7
80	A cone with a semi-globe joined to its base	28.70	18	10	44.0
81	The preceding solid reversed, or the conical part foremost	28.08	17	48	40.5
82	A double cone whose greatest breadth is ⅓ from one of its ends	28.38	17	59	21.6
83	The preceding solid reversed, or the shortest part foremost	27.30	17	20	47.6
84	A double cone	28.28	17	55	48.0
85	A wedge	27.48	17	27	14.4
86	The preceding solid reversed, or the base foremost	22.85	14	39	5.6
87	A double wedge	27.22	17	17	55.5

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
88	A pyramid	27.01	17	10	23.5
89	The preceding solid reversed, or the base foremost	22.10	14	11	25.4
90	A double pyramid	26.65	16	57	27.1
91	A cylinder	26.60	16	55	39.1
92	A cube	24.49	15	39	11.4
93	The preceding solid diagonally	23.40	14	59	18.7
	N. B. The descending chord in these Experiments (with the larger Pendulum) was 36.85 inches, the length of the solids in general was four inches, and the breadth two inches.				
	Double wedge two sides of which were rectilineal, the other two curvilineal	27.15	17	15	24.9
	Long cylinder. N. B. This experiment was made to discover whether friction had any sensible effect	26.60	16	55	39.1
	Newton's solid with the top and bottom rounding outwards	31.32	19	42	54.9

TABLE IV.

SOME OF THE SOLIDS TRIED BROAD-SIDE FOREMOST.

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
1	Newton's solid with the top and bottom made triangular, or reduced to four flat sides	21.75	13	58	28.3
2	A double circular spindle whose breadth is $\frac{1}{4}$ from one end, and whose whole length was six inches	21.35	13	43	38.4
3	A solid composed of segments of circles whose length was 4 inches and breadth 1.40 inches	25.61	16	19	54.0
4	Newton's solid reduced to four concave sides	20.00	13	00	50.0
5	An elliptical spindle reduced to four flat sides	21.60	13	52	54.8
6	A circular spindle whose length was equal to Experiment 2, viz. 6 inches	21.37	13	37	6.3
7	A circular spindle reduced to three flat sides	22.30	14	18	48.8
8	Newton's solid lengthened by the addition of a cylinder in the middle	19.45	12	32	46.2
9	A catenarian spindle fluted with 16 flutes	24.97	15	56	40.3
10	Newton's solid with its greatest breadth $\frac{1}{4}$ from its end	23.48	15	2	14.8
11	A double elliptical spindle whose greatest breadth is $\frac{1}{4}$ from its end	23.50	15	2	58.8
12	Newton's solid	24.03	15	22	23.5
13	A double circular spindle whose greatest breadth is $\frac{1}{4}$ from its end	24.71	15	45	12.5
14	Newton's solid continued out to a point	23.10	14	48	17.5
15	A double circular spindle whose greatest breadth is $\frac{1}{4}$ from its end	23.80	15	30	58.5
16	An elliptical spindle lengthened by the addition of a cylinder in the middle	19.55	12	36	30.9
17	A circular spindle reduced to six flat sides	22.95	14	42	46.4
18	An oval spindle	24.45	15	37	43.5
19	A double circular spindle whose greatest breadth is $\frac{1}{12}$ from its end	24.90	15	54	7.5
20	A catenarian spindle	24.30	15	32	15.5
21	An elliptical spindle	24.05	15	23	7.4
22	A very obtuse oval spindle	23.40	14	59	18.7
23	A cylinder with a semi-sphere joined at each end	23.20	14	51	58.6
24	An elliptical spindle cut at right angles to its axis, and then a semi-globe joined to its base	26.09	16	37	15.6
25	Half an elliptical spindle joined to half a circular spindle, each having been cut at right angles to its base	24.20	15	28	36.3
26	A very acute oval spindle	24.40	15	35	54.5
27	A double parabolic spindle	24.85	15	52	18.3



Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
28	A circular spindle	24.50	15	39	33.2
29	A double cone lengthened by the addition of a cylinder in the middle.	22.50	14	26	11.6
30	A catenarian spindle whose breadth is equal to the height of Experiment 20, and height equal to the breadth of Experiment 20	25.00	15	57	45.8
31	A cylinder with half an elliptical spindle joined to its end and fluted with 12 flutes	23.25	14	53	48.2
32	A cylinder with half an elliptical spindle joined to its end, but not fluted.	23.05	14	46	27.1
33	A cylinder with half a circular spindle joined to one of its ends	23.20	14	51	58.0
34	A cycloidal spindle.	26.05	16	35	49.0
35	A cone with half a circular spindle joined to its base.	25.77	16	27	50.5
36	A double parabolic spindle whose greatest breadth is $\frac{1}{3}$ from one of its ends.	24.85	15	52	18.3
37	A double parabolic spindle whose breadth is equal to the height of Experiment 27, and height is equal to the breadth of Experiment 27.	24.61	15	43	33.9
38	An epicycloidal spindle.	27.41	17	24	44.0
39	Half a circular spindle whose breadth is two inches and length $\frac{3}{4}$ of 4 inches.	27.00	17	10	1.9
40	The halves of two circular spindles joined at their bases, the one concave and the other convex.	26.57	16	54	34.2
41	A solid of the least resistance according to Emerson, its greatest breadth $\frac{1}{3}$ from its end	21.35	13	43	38.4
42	A parabolic spindle	28.52	18	4	20.3
	Double wedge two sides of which were rectilineal the other two curvilineal	21.55	13	51	3.6
	Long cylinder. N.B. This experiment was made to discover if friction had any sensible effect.	21.70	13	55	37.1
43	A solid of the least resistance according to Emerson	25.25	16	6	50.7
44	A cone whose altitude is four inches.	25.85	16	28	35.2
45	A circular spindle cut vertically, or half a circular spindle.	28.18	17	52	14.3
46	Two segments of a cylinder joined, that is a circular double wedge.	19.60	12	38	23.4
47	A frustrum of a cone of the least resistance	28.59	18	6	49.7
	Newton's solid with the top and bottom rounding outwards.	31.32	19	42	54.9
48	A cone with a semi-globe joined to its base.	27.28	17	20	4.6
49	A double cone whose greatest breadth is $\frac{1}{3}$ from one of its ends	26.09	16	37	15.6
50	A double cone.	26.32	16	45	33.7
51	A double wedge	18.85	12	10	15.0
52	A double pyramid	24.00	15	21	17.9
53	A cylinder.	26.60	16	35	58.6

TABLE V.

This Table contains the result of several Experiments made with solids of the same breadth with those which are described in the two preceding Tables, but of a greater length.

The length of the solids described in the former Table was four inches; the length of those in the present Table was seven inches. The breadth was two inches in both.

The solids on which these last Experiments were made, were of the driest and hardest mahogany; and were varnished as soon as the turner had given them their shape. This addition of the varnish, together with the difference in the wood, will account for some small variation between the result of these Experiments and of the former. It must also be observed, that a a smaller momentum was employed, which made the different degrees of resistance more perceptible.

Order in which the Experiments were made.	NAMES OF THE DIFFERENT SOLIDS.	Chords corrected for the centre of the Pendulum.	Angles answering to each chord.		
		Inches.	°	′	″
1	The pendulum	30.25	19	5	38.9
2	A double circular spindle whose greatest breadth was $\frac{1}{8}$ from one of its ends.	29.90	18	53	9.9
3	A double circular spindle whose greatest breadth was $\frac{1}{4}$ from one of its ends.	29.87	18	52	6.6
4	A double circular spindle whose greatest breadth was $\frac{1}{7\frac{1}{2}}$ from one of its ends	29.86	18	51	45.4
5	A double circular spindle whose greatest breadth was $\frac{1}{3}$ from one of its ends.	29.83	18	50	42.0
6	An elliptical spindle whose greatest breadth was $\frac{1}{4}$ from one of its ends.....	29.75	18	47	52.9
7	A circular spindle.	29.70	18	46	7.0
8	An elliptical spindle	29.60	18	42	35.4

N. B. The descending chord in these Experiments (with the larger pendulum) in Table V. was 35.35 inches.

Annexed to these Experiments there is the following annotation by Colonel Beaufoy; dated December, 1784.

" From a view of these Tables, it will be found that the result of many of the Experiments con-
" tradicts the prevailing theory of naval architects, and cannot, perhaps, be easily explained on
" any known hypothesis. This circumstance has led the writer to repeat his Experiments again
" and again, but finding the result confirmed, he thought it his duty to record them.

" Among the conclusions suggested by the Tables, one of the most curious is, that the
" increasing the length of a solid, of almost any form, by the addition of a cylinder in the middle,
" exceedingly diminishes the resistance with which it moves, provided the weight in water con-
" tinue to be the same. A fact, I apprehend, that cannot be easily explained.

" A second conclusion from the Tables is, that, contrary to the received opinion, a cone will
" move through the water with less resistance with its apex foremost, than with its base.

" A third, and more important, conclusion resulting from the Tables is, that the greatest
" breadth of the moving body should be placed at the distance of two-fifths from the bow.

" There are figures, indeed, that are exceptions to this rule: for, in the double para-
" bolic, the greatest breadth should be given to the middle, and in the double cone it should
" be placed still further back; but, as floating solids of these forms have no reference to use,
" the exceptions they constitute have no effect on the general rule when applied to Naval Archi-
" tecture.

" The common opinion, that the greatest breadth of a ship should be given to the middle, in
" preference to any other part nearer the bow, seems to have arisen from a desire of dimi-
" nishing the angle of incidence. But, though the advantage of that diminution is undoubtedly
" great, yet it is more than balanced by the disadvantage of the increase it occasions in the
" surface.

" From an attentive consideration of these two circumstances, it would not, perhaps, be diffi-
" cult to ascertain, by calculation, the point at which the greatest breadth of a vessel should be
" placed. Be this, however, as it may, the Experiments clearly prove that a ship will move through
" the water with the least resistance when her greatest breadth is distant from the bow two-
" fifths of her whole length.

" A fourth conclusion suggested by the Tables is, that the bottom of a floating solid should be " made triangular, as in that case it will meet with the least resistance when moving in the " direction of its longest axis, and with the greatest resistance when moving with its broadside " foremost.

" Such are the most important of the many conclusions which the Experiments recorded in " the different Tables have suggested to my mind.

" Mr. EMERSON has published, in his Mechanics, a table for the construction of a solid, " which, in his opinion, will move through the water with the smallest resistance. Of the prin- " ciples of his system, as I do not find them any where explained, it is difficult to judge; but " certain it is that, in practice, the construction he recommends is inferior to a variety of others.

" When the conclusions suggested by the Tables are considered with a view to practical im- " provements in the system of naval mechanics, it is necessary to attend to the effect produced " by the water on the after part of the moving body. For if the solid moves with a velocity less " than that with which the water presses to the opening occasioned by the motion of the solid, " that excess in the velocity of the water has a tendency to diminish the velocity of the solid. " But if the velocity of the solid is exactly equal to the velocity of the water which presses in " behind, the motion of the back-water will not be attended with the least effect. And if the " velocity of the solid be greater than that with which the water rushes to the opening, the " resistance made to the solid will be increased by the weight of water resting upon it in conse- " quence of the vacuum."

In a maritime and commercial country like Great Britain, it is evident that the most effectual management of its NAVAL strength must constitute an object of the first magnitude and importance. As the fleets of a kingdom so circumstanced are the foundation of its consequence among neighbouring nations, and the defence of its commerce in time of war; it must follow, as an undeniable truth, that the safety, the prosperity, and even the existence of its commerce, must very much depend on the excellent construction of the ships in its service.

It is but too well known to all who have any skill in Naval Architecture, that the theory is not so well understood as it deserves; and that the Swedes and French actually surpassing the

English in this most important art, the French have derived many advantages from this superiority in time of war.

Now, in a country so fertile as Great Britain in men of genius, where the most skilful and industrious workmen are always to be found, and the best materials to be procured, nothing but public encouragement, and a firm union of theoretical and practical ability, can be wanting to produce the desired remedy, and to enable England to excel, not only her neighbours the French, but all other maritime countries, in constructing SHIPS OF WAR and MERCHANT-MEN.

For these reasons, and in order most effectually to accomplish so desirable a purpose, it was proposed to establish "*A Society for the Improvement of Naval Architecture;*" the grand object of which should be, to improve and strengthen the Royal Navy of Great Britain, and her shipping in general, for the benefit of the public and merchants' service.

A meeting, in consequence of a public advertisement for that purpose, was accordingly held at the *Crown and Anchor Tavern* in the *Strand*, on Thursday, the 14th of April, 1791, to take into consideration the expediency of instituting "A SOCIETY FOR THE IMPROVEMENT OF NAVAL ARCHITECTURE." It was attended by a numerous company of noblemen and gentlemen, when it was unanimously agreed:—

"That the theory and art of ship-building being objects of the first magnitude and importance "to these kingdoms, and not so well understood in this country as matters of so much conse-"quence deserve, a remedy for this radical deficiency merited the attention of every well-wisher "to the true interests of Great Britain.

"That the most effectual remedy for this deficiency would be, to concentrate the theoretical "and practical wisdom of this country, by the institution of a Society for the Improvement of "Naval Architecture.

"That such a Society be instituted, under the direction of a president, vice-presidents, and "other officers, and that His Royal Highness the Duke of Clarence be requested to accept the "office of president, and to lay the plan of it before His Majesty."

Thus it was that the Society was first instituted and established. His Royal Highness the Duke of Clarence complied with the request of the SOCIETY with a readiness that does honour to the eminent station he occupies; and the subscriptions of members, every way respectable for their talents and reputation, exceeded the expectations of the warmest friends of the Institution.

The principal intention of the Society, as the name of the Institution implied, was the improvement of Naval Architecture in all its branches; for it cannot be conceived that the Society had any idea of confining themselves to one branch of the art, but that it was their intention to extend their inquiries and improvements to vessels of every kind.

To promote this important object as effectually as possible, the Society proposed to encourage every useful invention and discovery as far as might be in their power, both by honorary and pecuniary rewards. They had in view, particularly, to improve the theories of floating bodies and the resistance of fluids,—to procure draughts and models of different vessels, together with calculations of their capacity, centre of gravity, tonnage, &c.,—to make observations and experiments themselves, and to point out such observations and experiments as appeared best calculated to further their designs, and most deserving those premiums which the Society could bestow.

But though the improvement of Naval Architecture in all its branches was certainly the chief purpose of this Institution, yet the Society did not by any means intend to limit themselves merely to the form and structure of vessels. Every subordinate and collateral pursuit was to claim a share of the attention of the Society in proportion to its merits; and whatever might have any tendency to render navigation more safe, salutary, and even pleasant, was not to be neglected.

Had the Society attained that magnitude which there was room to expect from the superior utility of the object, and the extraordinary public spirit that manifests itself whenever any thing really beneficial to mankind is proposed for general protection and encouragement, they further intended to assist young persons in the attainment of this most useful art, and even to institute an Academy for the regular study, not only of the art itself, but of those sciences which ought to form the basis of it.

The Society resolved, by the assistance of their own members, and other gentlemen properly qualified, to make a series of experiments on the resistance of water, upon a much more extensive scale than any which had yet been made in this or any other country.

A committee of gentlemen was chosen for the purpose of conducting the experiments.

The Greenland Dock was fixed upon as the largest and most convenient piece of still water for the purpose near London, and they chose the upper end, as there they would be less liable to be disturbed by the general business of the dock; and conceived that the 400 feet run, and 11 feet depth of water, obtained at that part of the dock, were amply sufficient to answer the views of the Society.

Though a committee of gentlemen was chosen, all of whom entertained the most ardent desire to render themselves useful in the business, yet from their professional and other individual concerns, few of them were able to bestow more than their occasional assistance. The whole onus, therefore, of regular attendance from first to last, and of conducting the process, (for he never absented himself for a single day,) was borne by Colonel BEAUFOY; the assistant secretary to the Society, Mr. JAMES SCOTT; and by Captain JOHN LEARD, as often as his nautical duties would permit him to attend.

For some years the calculations were made at Colonel BEAUFOY's residence at Hackney Wick, by himself, assisted by his wife, who contributed no inconsiderable share to the progress and success of the Experiments: for, favoured alike in person and in mind, being a woman of considerable talent and scientific attainments, besides the usual female accomplishments in which she excelled, she was a good mathematician and practical astronomer, familiar with all the details of the observatory, the calculation of eclipses, &c.; and by method and strict economy of her time, while the domestic arrangements proceeded with perfect regularity, she was never at a loss for leisure in the furtherance of her husband's pursuits. But,

> "Pauca decet..... rosâque tabellis
> "Ut bene depictâ floris odore caret."

She died in the year 1800, at an early age, after a few hour's illness; an irreparable loss to her husband. He survived her twenty-seven years, and proved the sincerity of his attachment to her memory by not marrying again. A few hours before he died, he spoke of her with emotion, which shewed that time had not caused the smallest diminution in his affection for this estimable woman.

After her decease the calculations were continued by Colonel BEAUFOY, in association with the assistant secretary, Mr. JAMES SCOTT. These calculations were attended with great labour and trouble, and occupied more than ten years subsequent to the final close of the Experiments at Greenland Dock. Colonel BEAUFOY verified them for the fifth time shortly before his death.

That a Society, with objects so important, and commenced under such favourable auspices, should have sunk into decay for want of funds, is deeply to be regretted. In consequence of this event the Experiments were, for a considerable period, conducted and brought to a conclusion solely at the expense of Colonel BEAUFOY.

At length, however, he had the satisfaction of seeing a perfect copy of the whole of the Experiments, with appropriate drawings of the apparatus and solids employed, comprised in two folio volumes. To the First Volume of which he appended a notice, that "this was the only complete "copy of the Experiments in existence." It is from this copy that the present publication is taken, without alteration or addition.

In Thomson's Annals of Philosophy for January, 1814, the learned editor, now Regius Professor of Chemistry at Glasgow, inserted a short extract from these Experiments, accompanied by the following notice to his readers:—

"These Experiments are so numerous, that it would be impossible to introduce them all into "a work of this sort (The Annals,) without devoting to them the whole of several successive "volumes; a sacrifice which we could not make consistently with propriety. All we shall "attempt, therefore, at present, will be to exhibit a view of the weight necessary to move each "of the substances tried with one determinate velocity."

This insertion in the Annals of Philosophy was the means of bringing the fact of such Experiments having been made in England, under the notice of the Swedish litterati; who, though misled as to the scale, and as to the extent to which Colonel Beaufoy's Experiments had been carried, owing to the brevity of the Doctor's paper, were nevertheless much interested by that little which the Annals afforded them.

Unknown to either party, simultaneous experiments had been carried on in Sweden and in England, both sets of philosophers having in view the solution of the same question. The Swedish Experiments were conducted under the sanction and at the expense of the Society of Iron Masters at Stockholm, by Messrs. Lagerhjelm, Forselles, and Kallstenius, and were tried at Fahlu Mine, in the years 1811, 1812, 1813, 1814, and 1815.

In 1819, Assessor Lagerhjelm was so good as to send Colonel Beaufoy six copies of the First Volume of the Swedish Experiments, which he distributed forthwith to each of the several public departments in England, to whom it might be supposed the cultivation of the noble science of Naval Architecture would be not less a pleasure than a duty. But no notice was taken by any of them, beyond the formal acknowledgment of the receipt of a book. Colonel Beaufoy then made two ineffectual attempts to procure a translation of the work into English at his own expense; but owing to the want of mathematical knowledge upon the part of the translators, their

version was not more intelligible to an Englishman than the original language. Thus circumstanced, he saw just enough to excite, without gratifying, his curiosity, until a visit to England in the year 1825, by Assessor LAGERHJELM, enabled the Colonel to get a glimpse of the result of the labours of his Swedish coadjutors.

The Assessor took this opportunity of looking over Colonel BEAUFOY's manuscript copy of the Experiments, from which inspection he found that they far exceeded the opinion he had been lead to entertain, judging from the abstract in Thomson's Annals.

Shortly after, the Assessor sent over copies of the Second Volume of the Swedish Experiments; but which, unfortunately, owing to the cause already stated, were equally unavailable to the English reader.

Colonel BEAUFOY, at his death in 1827, bequeathed his manuscripts to his eldest son, who determined, should an opportunity ever present itself of procuring a correct translation into English of Assessor LAGERHJELM's work, to fulfil his father's wishes by publishing the whole of the Swedish and English Experiments together, for the benefit of those who might feel disposed to prosecute the investigation hereafter.

The Swedish language is rarely cultivated in England, and consequently it became extremely difficult to meet with a person who could combine the capabilities for translating a mathematical and abstruse work from Swedish into English, with a disposition to undergo the labour of arranging papers,—of superintending the press,—and of preparing, by way of preliminary, exact copies of the original manuscripts for the printer.

After many fruitless enquiries, and when there appeared no chance of the work being published agreeable to the Colonel's intentions, a lucky incident occurred which removed every difficulty.

A young clergyman, the Rev. ELIJAH SMITH, late of Sidney Sussex College, Cambridge, having proceeded as one of His Majesty's chaplains to New South Wales, had been compelled, soon after his arrival in the colony, to resign the appointment, and return to England, in consequence of the climate disagreeing with Mrs. SMITH.

Being a friend of the family, he yielded to solicitation, and in 1829 commenced the task of editor and translator for the present work. Having, in the first instance, arranged Colonel BEAUFOY's papers, and indexed such as had been already published, he proceeded to make a

correct copy of the Nautical Experiments for the use of the printer, to guard against any accident befalling the original.

While this was in progress, he laboured hard at the Swedish language, to qualify himself for the duties of translator.

By the Spring of 1832, Mr. SMITH had succeeded in translating the First Volume of the Swedish Experiments, when he proceeded to Stockholm to lay the translation before the learned author, Assessor LAGERHJELM, who, being an excellent English scholar, could satisfy himself that the translator had rendered the Swedish into English according to the true spirit and meaning of the author.

The Assessor was pleased to express himself in terms of warm commendation of Mr. SMITH's performance, and zealously afforded him every assistance towards the perfection of the undertaking. Not content with loading his English visitor with personal kindness and attention, he interested himself in bringing the object of the reverend gentleman's voyage to Stockholm before the Society of Iron Masters, who, doubtless at Assessor LAGERHJELM's suggestion, most liberally and considerately offered the use of the copper-plates belonging to the original Swedish work, in order to facilitate and diminish the expense of the publication.

In the summer of 1833, Mr. SMITH, having completed the translation of the Second Volume of the Swedish Experiments, will proceed forthwith to translate, and prepare for publication, the "*Tentamen Theoriæ Resistentiæ Fluidorum constituendæ*," written by Assessor LAGERHJELM; on the completion of which, he purposes to visit Stockholm a second time, (probably in the course of the winter of 1833,) in order to avail himself of the learned author's friendly offer of assistance.

The work will consist of Three Volumes.

The First Volume will contain Colonel BEAUFOY's Experiments upon the Resistance of Solids moving through Water, made at Greenland Dock, divided into the First and Second Series, containing the whole of Vols. I. and II. of the original MS.

The Second Volume will contain the Translation of the First and Second Volumes of the Swedish Hydraulic Experiments, and also that of the "*Tentamen Theoriæ Resistentiæ Fluidorum constituendæ*."

The Third Volume will contain Colonel BEAUFOY's Miscellaneous Papers, chiefly reprinted from Thomson's Annals of Philosophy. These Papers are numerous, and treat on ASTRONOMY, NAVAL ARCHITECTURE, AIR, MAGNETISM, METEOROLOGY, TIDES, TRIGONOMETRY, SOUND, and other scientific subjects.

It is possible that these Miscellanies may require a Fourth Volume; but, be that as it may, the Second Volume will include the Translation of the First and Second Volumes of the Swedish Experiments upon Hydraulics, and will close with Assessor LAGERHJELM'S "*Tentamen Theoriæ* "*Resistentiæ Fluidorum constituendæ.*" If Providence permits, such is the course of publication intended to be pursued. The uncertainty of human life, and the vicissitudes of health and circumstances, may not suffer the fulfilment of the entire work. The object must be, therefore, to make each volume complete in itself.

The united experiments made by the English and Swedish philosophers have not cost so little as £.50,000 sterling; and it would be a melancholy event should fire or accident deprive the world of a body of Experiments, which are believed to be unparalleled in extent and accuracy, by any that have been made heretofore upon this particular branch of hydrostatics.

The number of copies (1500), multiplied as they now will be through the medium of the press, may possibly snatch the labours of these disinterested men from oblivion.

The whole course of Colonel BEAUFOY'S life was devoted to the cultivation of science, and spent in the advancement of useful knowledge; yet, in no one instance, did he seek (much less derive) the smallest personal advantage from his scientific occupations. His aim was to be useful in his station,—his ambition was to contribute his mite to the aggregate of human improvement,—and, with the exception of the commencement of the Greenland Dock Experiments, the whole of his researches were conducted by himself, and at his sole expense.

In vain did he endeavour to stimulate those in authority, by frequent representations, to follow up the Resistance of Solids in Water by further experiments at the expense of the English Government.

He was most anxious to have had the Greenland Dock Experiments continued by the substitution of CIRCULAR for RECTANGULAR figures.

Notwithstanding some little has been done towards the accomplishment of the end in view, much more still remains to be effected by succeeding experimentalists in the same path of science; and it is left for them, by future investigation, to impress a positive and permanent value upon that little which he has done.

As Colonel BEAUFOY'S scientific labours were given to the public gratuitously, so, likewise, are these volumes intended for the honour of gratuitous distribution.

POSTSCRIPT TO THE PREFACE.

The preceding Preface was written by the Publisher at a time when he had every reason to flatter himself that the Work would have proceeded according to the original plan of publication. He expected, from the engagement of a responsible Editor, without limitation as to time, to have secured to the Work the most minute attention as to correctness, arrangement, and illustration by notes. Already occupied eighteen hours per day in his own avocations, he could not have undertaken the charge of editing the Book with satisfaction to himself; and, not doubting but that Mr. Smith would acquit himself with his accustomed intelligence and accuracy, the Publisher was content to leave the entire management of the Manuscript to him. But, the appointment of Mr. Smith to the Chaplaincy of the Russian Factory at Archangel, and his consequent departure from England at Midsummer 1833, has thrown the task of editing the Work most unexpectedly upon the Publisher; as, except copying the Manuscript for the Printer, the personal labour and inconvenience incurred has been so great as to more than neutralize the assistance he expected to receive from Mr. Smith.

When Mr. Smith quitted England, the Tables in the First and Second Series of Experiments were printed; and he left the Work, as he supposed, ready for delivery, with the exception of the drawings and engravings. But the Publisher soon satisfied himself, that the state in which it then was, rendered it quite unfit for publication, as will be readily perceived on reference to the Table of Discrepancies; and nearly the whole contents of the Work, from the title to the first page of the Experiments, have been added or altered since Mr. Smith's departure. In fact, the Book has been treated as though Mr. Smith had never seen it. Many of his queries at the bottom of the pages were found to be erroneous, and have caused several sheets to be cancelled.

The fact of Mr. Smith's having queried *some* of the errors naturally lead to the conclusion that, in copying the Manuscript, he had corrected it as he went on, and that having made these corrections, the Tables might be considered as accurate. But, on reading the Work for errata after Mr. Smith had left, the Publisher discovered many mistakes in the original Manuscript, which, having escaped the observation of Mr. Smith, had been printed without being queried.

This discovery convinced the Publisher of the necessity of a careful and minute examination of the original Manuscript. Each column was first corrected separately, and the several columns were then checked by each other. These errors are given in the Table of Discrepancies. They are principally single figures wrong *per se*,—mere lapses of the pen in copying the Experiments into the fair book, not affecting any other line or figure, nor altering the value or powers of the Tables. They invariably occur, except in one instance, above the star (*); and therefore would not, under any circumstances, affect the calculated results. Nevertheless, after many readings and re-readings the smallest errors, when detected, have been thought sufficiently important not to be passed over unnoticed in the Table of Errata.

Colonel BEAUFOY having repeatedly verified the RESULTS of the Experiments, these it was thought unnecessary to recalculate; besides which, it would have been the labour of years, and would have prevented the publication of the Work altogether.

During this examination, the Publisher discovered further, that the Introductory Observations prefixed to the First Volume of the Manuscript (containing the First Series of Experiments, made in the years 1793, 1794, 1795), and which were those that Mr. SMITH had selected for publication, were inferior in many respects to the Explanatory Observations prefixed to a summary of the Second Series of Experiments made in 1796, 1797, and 1798, printed in the Report of the Committee.

This printed Report had been drawn up by Colonel BEAUFOY for the use of the Members, and was published by the Society under the title of "*The Report of the Committee for conducting the Experiments of the Society for the Improvement of Naval Architecture.*" In this Report, observations are made and Tables given which are not to be found in the Manuscript, but which place the nature of the Experiments and the method of making the calculations in a clearer point of view.

It may be said, that the two Introductions might have been blended, with advantage to the Work and convenience to the Reader. On consideration, this opinion will probably yield to that of the Publisher: because, the velocities in the Experiments made in 1793 being indicated by *feet and inches*, and in those of the subsequent years by *feet and the decimal parts of a foot*, as the term for expressing the velocities throughout the Manuscript, and by *nautical miles* throughout the printed Report: it would have been necessary, for the amalgamation of the two Reports to reduce the whole to the same denomination. This would have been attended with a great sacrifice of time, and would have multiplied the chances of mistake.

Besides, the Analytical Tables of the Experiments published in the Report having been converted purposely from feet per second into nautical miles per hour, to make the Experiments available to practical men, it would appear more in accordance with Colonel Beaufoy's views to reprint the Report, retaining the form which he himself had selected.

The scarcity of the book, which had been long out of print, is an additional inducement for reprinting it; and the Publisher has availed himself of the opportunity thus afforded, to correct some errors of the press in the Tables, and to revise the calculations. The two Introductions thus united, though not quite free from tautology, will afford much valuable information.

In page xxxi, it has been stated, that the Second Volume of this Work would contain the Translation of the First and Second Volumes of the Swedish Experiments. Upon further consideration, it has been deemed preferable to deviate from this arrangement; inasmuch as Mr. Smith having proceeded to Russia, it is uncertain when he will be able to visit Stockholm, according to his original intention, for the purpose of submitting his Translation of the Second Volume, and of the Tentamen, to the correction of Professor Lagerhjelm.

From causes already mentioned in this Postscript, the publication of the First Volume of Colonel Beaufoy's papers has been delayed much beyond the period fixed upon; and should any unforeseen occurrence prevent a speedy fulfilment of Mr. Smith's intentions with respect to his journey, the publication of the Second Volume may be postponed to a distant and indefinite period, and might perchance never be printed at all. Besides which, the Second Volume of the Swedish Experiments, though highly valuable, has no immediate reference to nautical subjects.

The Second Volume of Colonel Beaufoy's Experiments will, therefore, contain his principal Papers upon Hydraulic and Nautical Subjects, as well as the First Volume of Professor Lagerhjelm's Work. By this arrangement, more time will be given to Mr. Smith to choose the most convenient opportunity for taking his journey: and, in the mean while, the printing of Colonel Beaufoy's Book will proceed without interruption.

The Experiments and calculations were originally written upon loose sheets of paper. The Manuscript Books left by Colonel Beaufoy are in the handwriting of Captain James Scott; but this copy has evidently never been read for errata. Colonel Beaufoy, in his repeated recalculations of the Experiments, was satisfied when he found that the results were verified; but his examination did not extend to the comparing of every individual figure in the body of the several Tables, as would have been done in reading for the press. But the Publisher, sub-

sequent to the printing of the Tables under Mr. SMITH's responsibility, having detected a considerable number of errors, carrying evident proof in themselves of being mere errors in copying, has constructed a Table shewing the readings as they stand in the Manuscript, contrasted by apposition with the readings as they should be, in the opinion of the Publisher, to restore them to the text of the Original. Though, as already stated, these discrepancies do not affect the RESULTS, or detract from the accuracy of those parts verified by Colonel BEAUFOY, it nevertheless will be proper, previous to using any Table for practical purposes or for calculation, to turn to the Table of Discrepancies, and see whether the Publisher has made any remark or suggested any alteration relative thereto.

This Work having been printed under an impression, that at some future period the Experiments and calculations recorded therein will form the basis of further investigation, the Publisher has not chosen to hazard the character of the Tables for fidelity, by venturing to make any alterations from the Manuscript. Where errors or discrepancies have been observed, they will be found either in the Table of Corrected Readings or as queries at the foot of the page. The reader is thus left to his own discretion, and is placed precisely under the same circumstances as the Publisher, for the exercise of his own judgement. Most of the errors are trivial, and, but for the scruples before adverted to, might have been altered with advantage to the Reader. But Colonel BEAUFOY, as is well known to those who have seen him engaged in experimenting, was so punctilious with regard to truth, that he recorded all the details in strict accordance with the facts; where he had reason to suspect the Experiment was doubtful, it was nevertheless set down with the rest, and, if rejected, a remark was annexed to that effect. Entertaining, then, so great an aversion to any thing that bordered upon *coaxing* his Experiments, the Publisher is satisfied that his Father would much rather the Tables should appear before the Public with all the faults of Captain SCOTT's Manuscript to speak for themselves, than that any attempt should be made to garble and, perhaps, stultify the Original, because the discrepancies do not always admit of direct or even a *safe* collateral proof.*

* In justice to Mr. JAMES SCOTT (afterwards Captain SCOTT), it should be stated, that he copied the Experiments by candle-light in the evenings after the business of the day was over, and as opportunities offered. He scarcely lived to finish the Manuscript; the drawings and description of some minor details of the apparatus were incomplete when he died. The intention of the Publisher, that all errors or discrepancies in the Manuscript, or explanatory remarks, &c. upon the Experiments, should be inserted as queries or as notes at the foot of the page to which they referred, has been disappointed through Mr. SMITH. At one time the Publisher felt disposed to have cancelled the whole edition (1850 copies), and to have reprinted the Work; but seeing that he had already paid more than three thousand pounds for what had been done, he thought it more advisable to adopt the plan of inserting the Table of Corrected Readings: a decision which, under all circumstances, he trusts will meet with the approbation of the Reader.

INTRODUCTORY OBSERVATIONS

PREFIXED TO THE FIRST VOLUME OF THE MANUSCRIPT, CONTAINING THE FIRST SERIES OF THE EXPERIMENTS, VIZ. THOSE MADE

IN THE YEARS 1793, 1794, 1795, AND PARTLY THOSE OF 1796.

The Society having formed the resolution, that the most eligible mode of improving Naval Architecture, would be by making Experiments relative to the resistance of water on various shaped bodies; an apparatus for that purpose was erected at Greenland Dock, and the labour for fulfilling the patriotic intentions of the Institution commenced in the year 1793 and terminated in 1798.

The Experiments consist of two parts: one set having been made near the surface of the water, the other at the mean depth of six feet; and, without in the least depreciating the labours of Monsieur d'Alembert, the Marquis de Condorcet, the Abbé Bossut, the Chevalier de Borda, Doctor Franklin, and many others, who have bestowed much attention and time on the subject, it is presumed that the intentions of the Society have, in some measure, been accomplished; and, as the Experiments discover circumstances not before known, it is thought great advantage may hereafter arise in the formation of ships; at any rate, it is evident, by a similar apparatus hereafter described, that the advantages and disadvantages of different formed head ends, and various shaped after or stern ends, may, with proper models, be accurately ascertained; nor should the improvement of measuring time by space be overlooked; for, by adopting the former mode, a second was divided into a thousand equal parts; a circumstance new in the annals of Experiments made on the Resistance of Fluids.*

* The following Experiments are not the same as those given in Colonel Beaufoy's Report and published by the Society; in this case, a mean of many has been taken: for, it is generally observed, that a number of lunar observations, made with a sextant divided into minutes, is preferable to a fourth part of the same number made with a sextant divided into fifteen seconds, the errors having a tendency to correct each other: and so it is in Experiments.

It is to be observed, that those Experiments, generally speaking, made beneath the surface of the water in the year 1798 are the most to be relied on; they have been, however, occasionally combined together: for instance,—the Experiments made for determining the friction of water, at the mean depth of six feet, are those made in the years 1796 and 1798. A register of the weather, the heat of the water and atmosphere, as shewn by Fahrenheit's thermometer, in most of the Experiments, is set down at the commencement of each day's labour, as well as the system of blocks or pullies to which the total weight was hung; thus,—the *system four-fold* means there were four parts of running line; and, to obviate objections, the figures were at times drawn through the water with a single line, and the result was the same as when a number of pullies was used.

It would evince a want of gratitude, if these Introductory Observations were concluded without acknowledging the many favours received from Mr. RANDALL, Mr. BRENT, Sen., Mr. SAMUEL BRENT, Mr. DANIEL BRENT, and Mr. GARNETT. Indeed, without the assistance of these gentlemen, it may be averred, the Experiments would never have been undertaken, and most certainly they never would have been finished. The ability of these gentlemen in mechanical contrivances was admirably displayed in their manufactory of patent blocks, &c., and which, unfortunately for the country, was discontinued on Mr. GARNETT's going to America.

These remarks will finish by regretting the death of Mr. RANDALL. This gentleman fell a victim to the scandalous and most infamous conduct of the shipwrights at Rotherhithe. A set of men whom he took care of when ill. He built a school for the instruction of their children, and the return made for his benevolence was by striking him in a riot, which produced a fever that terminated his existence.

CHAP. I.

DEFINITIONS AND EXPLANATORY OBSERVATIONS.

By HEAD PRESSURE, is meant the Total Pressure which exists against the head end or foremost part of a body, immersed either wholly or in part in any given fluid when such body is at rest.

By STERN PRESSURE, is meant the Total Pressure which exists against the stern end, or hindermost part of a body, immersed either wholly or in part in any given fluid when such body is at rest.

By PLUS PRESSURE, is meant the Additional Pressure which is sustained by the head end, or foremost part of a body, moved through a fluid; which Additional Pressure is over and above what we have termed the Head Pressure, and arises from the fluid being obliged to be displaced in order to permit the moving body to pass through it.

By MINUS PRESSURE, is meant a subtraction of Pressure from the Stern Pressure, and which subtraction is occasioned by the fluid not pressing so strongly against the stern end, or hindermost parts of a body, when such body is in motion through the fluid as when the body is at rest.

By FRICTION (as relating to this subject), is meant that sort of resistance to a body moved through a fluid, which arises either from the adhesion of the particles of the fluid to the surface of the moving body, or from the roughness of the body; or from both those causes united.

By TOTAL RESISTANCE, is meant the sum total of the Plus Pressure, the Minus Pressure, and the Friction united.

By HEAD RESISTANCE, is meant the Plus Pressure and the Friction of the water against the head end united.

By STERN RESISTANCE, is meant the Minus Pressure and the Friction of the water against the stern end united.

The Experiments made at the surface of the water in the years 1793 and 1794,* are inserted more as a matter of curiosity than with a view of deducing accurate results; they, however, serve to prove the superior excellence of the subsequent Experiments, as well as the gradual progress that was made towards accomplishing the views of the Society. To be more particular, it was observed when an obtuse body moved with greater velocity than six feet per second, a quantity of water was thrown upon the top of the figure, and the quantity became greater as the velocity was increased; and, with some velocities, the body became completely immersed. Thus, that part of the resistance caused by the friction of the water became uncertain; and, consequently, any deduction from the Experiment inconclusive. This is evident, by comparing the Experiments made in the year 1793, with Parallelopipedons A and B. It is true, this remark will not apply to acute or sharp pointed bodies, such as triangles; it being, however, impossible accurately to compare the resistance of the base with the resistance of the vertex, the Experiments lose much of their value; not to mention, that the subsequent Experiments, made with the apparatus in an improved state, are to be preferred.

* For reference to the Bodies tried in 1793, see GENERAL TABLE, p. 47; and for those of 1794, p. 73.

CHAP. II.

ON THE EXPERIMENTS MADE IN 1795.

By comparing the Experiments with the parallelopipedons a and b,* it appears that the longer one has a greater resistance than the shorter; but, as these two bodies have all their dimensions the same, excepting their lengths, and their surfaces being of the same degree of smoothness these different degrees of resistance should be solely attributed to the friction of the water (see page 74); where it appears that the maximum is at eleven feet per second, and afterwards decreases; but as these shaped bodies are ill adapted for ascertaining the point in question, recourse must be had to figures hbh, iai, pbp, and qaq, these bodies being well suited for the purpose; the first two being terminated by circular wedges, and the latter two by inclined planes, are not liable to the same objection (that of having the water thrown on the upper side,) as parallelopipedons a and b.

By comparing the Experiments made with these four solids, the first two figures make the friction on 77.16 superficial feet, with a velocity of 13.527 feet per second, equal to 40.17 lbs., and the last two to 36.33 lbs. avoirdupoise; the mean of these Experiments is considered as the friction, and the result is contained in page 159, and underneath is set down the law of the friction, by which it appears that the exponents decrease as the velocity becomes greater.

Having determined the retardation arising from friction and also the law, let us, in the next place, consider what conclusions may be drawn by considering the Experiments made with bodies b, bc, db, ebe, bf, gb, hbh, bk, lb, mbm, bn, ob, and pbp. By examining the Experiments with bodies b and bc, the addition of the after body c decreases the minus pressure at the velocity of 13.527 feet per second 3.75 lbs. (see page 87).

By comparing the Experiments made with db with those of b, that lengthening the fore part

* For reference to the Bodies tried in 1795, see the GENERAL TABLES, p. 322, 323, and 324.

of b with the body d (the same as o,) that the plus pressure, or head resistance, is at a velocity of 13.527 feet diminished 144.42 lbs. (see page 93).

Again, by adding the diminution of the minus pressure to the decrease of the plus pressure, the result would be nearly equal to the resistance of the body e b e (see page 100); the resistance of this last-mentioned body, however, has an excess of 18.51 lbs. This non-agreement of the two results may be partly accounted for by e b e having a greater surface than either of the other figures. As this increase of friction will not account for the whole effect, probably the difference may arise from its being too much immersed.

By continuing the comparison with b and the following figures, we shall find a very near coincidence of the minus and plus pressure until Experiments made with b n, o b, and p b p; in this case, the plus and minus pressure, as determined by altering the shape of each extremity with the same shaped body, exceeds the plus and minus pressure, as found by the Experiments with p b p, as the other fell short; the first being less by 18.51, and the Experiment we are speaking of being more by 15.36 lbs. The cause of this anomaly is satisfactorily explained by the water being thrown on the upper side of the figure b n, which increased the friction.

CHAP. III.

ON THE EXPERIMENTS MADE WITH THE BODIES mbm AND pbp.

HAVING concluded the last chapter by observing certain irregularities which could be accounted for, a very singular circumstance appears by comparing the Experiments made with the body **mbm** (see page 139) and the body **pbp** (see page 155); the water in both cases impinges on the same angle of incidence, and the circumstances only vary in one particular: the fluid, in the first case was divided laterally, that is to say, horizontally; and, in the latter case, the displaced water was forced underneath the bottom of the figure; but, it is very remarkable that the latter body should have so much less resistance than the former; nor is it less curious that, as an after-body or stern end, it has a decided superiority over the other.

For more readily comparing these facts with each other, page 322 is inserted; and, by inspecting the different Experiments, a constructor of vessels must be convinced of the vast advantage the oblique stern has over an upright one; and, if to this superiority be joined the great benefit that accrues in a head sea when turning to windward, it seems hardly possible that ships should not be built on this plan in future.

Before we proceed further, it may not be amiss to mention, that the bodies in the Second Series were only one foot square, whereas the experimented bodies in 1795 measured in breadth 1.219 feet, and as much in depth; consequently, the results of these Experiments must be reduced in the proportion of 1.4859 to 1, before they can be accurately compared with those of which we are speaking.

Unfortunately, for want of more Experiments, it is not possible to determine correctly the plus and minus pressure; we must, therefore, remain contented with the relative advantages one form has over another.

CHAP. IV.

ON THE DIFFERENCE OF RESISTANCE AND FRICTION NEAR THE SURFACE AND AT THE MEAN DEPTH OF SIX FEET.

By comparing the resistance of the bodies near the surface with those having similar head and stern ends, immersed to the mean depth of six feet, it is observed, that in all cases (friction excepted), those at the surface experience more retardation in dividing the fluid than the others immersed lower down. This will appear by the following examples: parallelopipedon b at the surface, when moving with a velocity of 13.527 feet per second, was resisted with a force equal to 332.47 lbs.; but friction constituting part of this quantity, it will be necessary to ascertain what it amounts to.

It has been observed, that when obtuse figures were drawn through the water with different velocities, the fluid more or less covered the upper part; the superficial area of the four sides of this figure is equal to 102.88 feet, and the friction on this surface (see page 81) amounts to 51 lbs.; consequently, the head and stern resistance, or the plus and minus pressure, is 281.47; this sum being reduced in the proportion of 1.4859 to 1, leaves 189.43. By the Experiment made with parallelopipedon P in 1796* (see page 392) it was only 176.35; therefore the resistance at the surface, in this case, exceeds the retardation at six feet deep by 13.08 lbs.

Again, by comparing bodies 1b and Ai, the latter is less resisted than the former by 19.698 lbs. (see page 563).

Thirdly, when the Experiments made with the body mbm (see page 139) are collated with the Experiment Aa (see page 514), the resistance of the former exceeds the resistance of the latter by 24.606 lbs.

The excess of the resistance at the surface, it is thought, proceeds from the minus pressure being in this case greater than it is lower down; and this idea seems to be corroborated by the parallelopipedon giving the resistance less than either of the other figures. For, it has been

* For reference to the Bodies tried in 1796, see the GENERAL TABLE, p. 412.

remarked that the water ran over the upper surface; consequently, the vacuity at the after part was sooner filled, the fluid in this Experiment flowing in four directions: whereas, in the other cases the water could only flow on each side and at the bottom.

It must, however, be acknowledged, that the Experiments made with a square iron plane at the depths of three feet, six feet, and nine feet, show the resistance to increase with the depression: but, on the other hand, it is to be remarked, that the conducting body was not of so proper a shape as those afterwards used; for, it is by no means improbable, that the resistance of the plane might elevate the sternmost extremity and depress the head; should this circumstance have taken place, the increased resistance is accounted for. The resistance of a plane one foot square, moving with a velocity of 13.527 feet in a second (according to the Experiments of 1795) is 213.66 lbs.; by a mean of the Experiments made in the year 1797,* the resistance was 196.245 lbs. Under all circumstances, these Experiments should be considered as only an approximation to an accurate result.

We shall conclude this chapter by observing, that the Experiments made with the planes placed obliquely to the shock of the fluid, are inserted more as a matter of curiosity than with a view of deducing accurate conclusions; this is evident, by examining the Experiments made with the plane turned outwards and inwards.

* For reference to the Bodies tried in 1797, see the GENERAL TABLE, p. 481.

CHAP. V.

ON THE DIFFICULTIES AND OBSTRUCTIONS EXPERIENCED IN CONDUCTING THE EARLY EXPERIMENTS.

Before the Experiments contained in the Second Series are examined and compared, it may be as well to mention some of the difficulties we had to encounter in fulfilling the views of the Society, were the whole of them to be written they would fill a volume; the leading or most prominent features will, therefore, only be mentioned.

To begin with the Experiments made at the surface of the water, especially those of the years 1793 and 1794, when the bodies were of considerable dimensions, and consequently both cumbersome and heavy, great trouble was found in making them come straight; for, inequalities in their shape, or having the ballast with which they were loaded not properly trimmed, caused them to deviate to the right or left of the path it was intended they should follow. To obviate this error, the rope that drew them was at times placed to the right and left (as occasion required) of the centre of the figure; at other times the ballast was shifted, and frequently both these corrections were required to be used, which not only gave a vast deal of trouble and vexation (not to mention the time lost in making hundreds of Experiments that could not be relied on), but, further, it was not uncommon for some of the obtuse bodies, by collecting a quantity of water on the fore part, to dive down to the bottom of the dock, then overset and tumble out the ballast; and, to add to the trouble, it became necessary to recover the lost ballast, which undertaking alone consumed a great deal of time.

The bodies with which the Experiments were made in the year 1795, being of smaller dimensions, lighter, more manageable, and consequently far better adapted for making accurate Experiments, gave us comparatively little trouble; it is these, therefore, and not the former, that are considered as giving accurate results.

Having briefly related the obstacles that retarded making the Experiments at the surface of the water, we shall now enter into those obstructions experienced at the mean depth of six feet, and begin with those of the years 1795 and 1796. The first remark to be made is relative to the undermost body. These solids being made of oak, were not only heavy and unwieldy, but had also the disadvantage of not being easily taken out of the water, when necessary to examine if

they were truly parallel with the conducting body; as, in the Experiments first made at the surface, these also were liable at times to deviate from their course from several causes, particularly from the want of parallelism to the conducting or upper body. What degree of reliance should be placed on these Experiments may be seen by comparing the Tables with each other; the greatest difference of the results is with bodies I (1795) and APi (1796), equal to 9.65 lbs.; of course, much cannot be said in favour of their accuracy.

The next set of Experiments to be noticed, are those made in the year 1796, the middle part being reduced in length to ten feet, the depth and breadth to one foot. But, before we proceed further, it will be necessary to notice a singular phenomenon, a source of much trouble and vexation, and which was the following: the two circular bars, which measured in diameter $1\frac{1}{4}$ inch, were brought within six feet of each other; this contraction of space had so great an effect, that not a single satisfactory Experiment was made between the 13th of April, 1796, and Wednesday the 13th of August, in the same year.

After examining the apparatus many and many times, and searching repeatedly the bottom of the dock with a view of finding out obstacles that could impede the velocity of the moving body, it at length occurred, that the proximity of the bars to each other might cause the hindmost bar to be affected by the eddy of the foremost. The bars were accordingly altered from a circular form to an elliptical one; the longer diameter being $2\frac{1}{4}$ inches, and the shorter $1\frac{1}{4}$ inch, and their separation was augmented to nine feet eight inches; these united circumstances completely obviated the cause of so much perplexity.

Almost all the figures when drawn through the water with a certain velocity, acquired a violent tremulous motion, which, in a small degree, may be illustrated by observing a large pot on the fire when it simmers. There was, however, another circumstance which took place, namely, the great rattling the bodies made whilst violently shaken: one or two of the bodies rolled when dividing the water, the cube being the most unsteady of the whole.

We shall conclude these remarks by observing, that the Experiments made in 1798 are the most accurate; the conducting body being wider had greater stability, and the immersed figures being shorter and lighter were more easily fixed and unfixed; the bar being also of a long elliptical shape, acted as a rudder, and prevented any deviation from the course; for, the smallest alteration in the bar effectually counteracted any swerving of the conductor, and did not add any perceptible increase to the quantity of resistance.

CHAP. VI.

ON THE EXPERIMENTS MADE IN THE YEAR 1796.

By comparing the experiments of this year with those made in 1798, it appears that the plus and minus pressure of APa,* with a velocity of 13.527 feet per second (and which, in the sequel, is hereafter to be considered as the velocity of comparison, unless expressed to the contrary), compared with Aa, exceeds the latter by 3.638 lbs.

Again, APe has a difference of resistance when compared with Ae equal to plus 15.34 lbs.; consequently, much reliance cannot be placed on these Experiments.

Again, APi, whose plus and minus resistance amounted to 67.27 lbs., exceeds the plus and minus (of Ai, p. 563) by 10.98 lbs.

Thirdly, EPa is resisted with a force equal to 49.27 lbs., but Ea is retarded with a resistance of 38.86 lbs., the difference of these two numbers being equal to 10.41 lbs. IPa's resistance amounts to 152.55 lbs., and the retardation of Ia is equal to 150.81 lbs., which may be termed a small difference.

There not being any similar Experiments made in 1798, the figure IPi (p. 392) cannot be compared unless it be with the bodies Ai (p. 563) and Ia (p. 617); the minus pressure of the former being 21.95 lbs., and the plus pressure of the water being 149.75 lbs., these two numbers amount to 171.70 lbs., and the resistance of IPi† to 176.35 lbs., the difference being 4.65 lbs., we may conclude the Experiments are not wide of the truth.

* For reference to the Bodies tried in 1796, see the GENERAL TABLE, p. 412; and for those of 1798, p. 688.

† IIe in the Manuscript, an error in copying.

CHAP. VII.

FURTHER REMARKS ON THE EXPERIMENTS MADE IN THE YEAR 1796.

It has been observed, when treating of the Experiments made at the surface of the water, that an inclined plane, whose angle of incidence was the same as that of a wedge, or triangle, experienced less resistance; the same advantage is obvious by comparing Experiments EPa and KPa, the latter Experiments being less resisted than the former by 2.51 lbs.*

Again, by examining the Experiments made with APk and APe, it is observable, that the former is less retarded than the latter by 7.24lbs.,† a sufficient proof of the advantage of the inclined or oblique stern. The Table in page 412 contains the results of all the Experiments made in this year, and the advantages and disadvantages are evident by inspecting the different columns.

With respect to the friction, the Experiments are deemed so satisfactory as to be included with the others, and a mean of the three results is taken as the truth.

* Deduct the Plus Pressure of KPa (page 371), at the velocity of 13.527 feet per second, viz. 45.70, from the Plus Pressure of EPa (page 361), at the same velocity, viz. 48.21.

† Should be 7.84. See Plus and Minus Pressures, pages 345 and 349.

CHAP. VIII.

ON THE EXPERIMENTS MADE IN THE YEAR 1797.*

THE first set of Experiments to be compared are those made with the Triangle M, drawn alternately with its vertex and base foremost. The friction being deducted from the upper and under surface, and likewise from the oblique sides (which latter quantity is reduced in proportion of radius to the cosine), will leave the plus and minus pressures: these two corrections being applied, the remainder will leave the correct resistance of the vertex, as well as the true resistance of the base; if, after these corrections are applied, we reduce the resistance of the base in proportion of radius to the sine of the angle of incidence (9° 35′ 38″), we shall be able to compare the result with the actual Experiment, for which purpose the annexed Table is constructed. On examination, it appears that the resistance of the apex in the greater velocities, is nearly as the resistance of the base reduced in proportion to the angle of incidence on which the water strikes the vertex.

	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Triangle M, vertex foremost, page 421.....	0.5773	1.8915	3.925	6.588	9.839	13.655	18.022	22.915	28.304	34.202	40.59	47.46	58.85
Surface for fric. 8.874 ft.	0.0330	0.1268	0.278	0.485	0.748	1.064	1.433	1.855	2.328	2.853	3.43	4.05	5.11
Plus and Minus Pressures	0.5443	1.7647	3.647	6.103	9.091	12.591	16.589	21.070	25.976	31.349	37.16	43.41	53.74
Minus Pressure, page 563	0.1629	0.6278	1.367	2.361	3.591	5.045	6.707	8.563	10.607	12.820	15.22	17.90	21.95
Plus Pressure.....	0.3814	1.1369	2.280	3.742	5.500	7.546	9.882	12.507	15.369	18.529	21.94	25.51	31.79
Triangle M, base foremost, page 425.....	0.9633	4.0518	9.283	16.649	26.138	37.745	51.452	67.27	85.15	105.11	127.14	151.23	191.99
Surface for fric. 8.874 ft.	0.0330	0.1268	0.278	0.485	0.748	1.064	1.433	1.855	2.33	2.85	3.43	4.05	5.11
Plus and Minus Pressures	0.9303	3.9250	9.005	16.164	25.390	36.681	50.019	65.42	82.82	102.26	123.71	147.18	186.88
Minus Pressure	0.0048	0.0196	0.045	0.082	0.129	0.192	0.266	0.35	0.45	0.56	0.69	0.82	1.06
Plus Pressure.....	0.9255	3.9054	8.960	16.082	25.261	36.489	49.753	65.07	82.37	101.70	123.02	146.36	185.82
Base reduced as radius is to the sine of the angle of incidence...	0.1543	0.6509	1.4934	2.6806	4.1937	6.0817	8.2925	10.846	13.729	16.951	20.504	24.394	30.971
Resistance of vertex per Experiment.....	0.3814	1.1369	2.280	3.742	5.500	7.546	9.882	12.507	15.369	18.529	21.940	25.51	31.79
Difference.....	0.2271	0.4860	0.7866	1.0614	1.3063	1.4643	1.5895	1.661	1.640	1.578	1.436	1.116	0.819

* For reference to the Bodies tried in 1797, see the GENERAL TABLE, p. 481.

The next Experiments are those made with the cube or body R; but, as this figure rolled, no accurate conclusion can be expected. With regard to the resistances of the square plane S and the round one T, it may be as well to take a mean of the two for the retardation of a superficial foot. In the next place, having obtained the resistance of a plane containing 144 square inches, and having also ascertained the minus pressure of a square stern (see Experiments of 1798), it may be possible to determine a point long disputed, viz. of what altitude must be a column of water, whose pressure is equal to the resistance of a plane moving through the water, the base of which is equal to the plane itself.

In the annexed Table, *Column* 1 contains the velocity of the plane, in feet, per second.

Feet.	Feet.	lbs.	lbs.	lbs.	lbs.	Powers.
1	0.0156	0.975	1.184	0.209	0.1629	.....*
2	0.0621	3.386	5.178	1.792	0.6278	1.9463
3	0.1399	8.745	10.395	1.650	1.3668	1.9188
4	0.2487	15.543	18.278	2.735	2.361	1.9000
5	0.3886	24.287	28.283	3.996	3.591	1.8791
6	0.5596	34.975	40.382	5.407	5.045	1.8646
7	0.7616	47.603	54.045	6.442	6.707	1.8473
8	0.9948	62.175	70.75	8.575	8.563	1.8296
9	1.2590	78.69	88.96	10.27	10.607	1.8174
10	1.5544	97.15	109.17	12.02	12.820	1.7985
11	1.8808	117.82	131.36	13.54	15.22	1.8004
12	2.2383	139.90	155.55	15.65	17.90	1.8640
13.527	2.8443	177.77	196.24	18.47	21.95	1.7028
1	2	3	4	5	6	7

Column 2.—Columns of water, the base of each being one square foot, and their respective altitudes equal to the space a body must fall to acquire the velocities of 1, 2, 3, 4, 5, 6, 7, &c. feet per second.

Column 3.—The weight of the different columns in pounds avoirdupoise.

Column 4.—The mean resistance of the planes S and T by experiment.

Column 5.—The differences between the theoretical and experimented resistances.

Column 6.—The minus pressure found by experiment: and

Column 7.—The powers of the minus pressure as determined by experiment.

* In Captain Scott's Manuscript the blank in the 7th column is at the bottom, which in the following page confuses the references to the Table. The blank should be evidently at the top, opposite foot 1.

On examining the Table, it appears that the difference between the resistance of the plane found by experiment and calculation, agrees very well with the minus pressure as determined by experiment, the minus pressure by experiment being greater; this difference may arise from the water not being able to escape from the anterior face of the plane without describing a curve, which has the same effect as if the plane had an increased surface.

Secondly, it appears that the powers in *Column* 7 decrease pretty regularly until the velocity of 10 feet, the mean decrease being 0.0185; if, therefore, the power of 1.7985 be decreased by this number, the power at 11 feet, instead of being 1.8004, will be 1.7800;* at 12 feet, 1.7615, and at 13.527 feet, 1.7430; consequently the minus pressure at 11 feet will be 15.190 lbs. instead of 15.22 lbs.; at 12 feet 17.706 lbs.; and at 13.527 feet 21.817 lbs.; in lieu of 21.95 lbs.; an evident proof that a small error in the Experiment makes a considerable alteration in the powers.

* Thus—

Power for 10 feet will be ...	1.7985
Deduct the mean	0.0185
Power for 11 feet will be ...	1.7800
Deduct the mean as before .	0.0185
Power for 12 feet will be ...	1.7615
Deduct the mean as before .	0.0185
Power for 13.527 feet will be	1.7430

CHAP. IX.

SOME OF THE EXPERIMENTS IN 1797 COMPARED.

The resistance of the cylinder, when compared with the mean resistance of the square and round planes with a velocity of 13.527 feet per second, appears to be less retarded by 9.57 lbs.;* and if the proper Experiments had been used the difference would have been less; a diminution too great to be satisfactorily accounted for, unless some error may have been committed in making the Experiments; a circumstance not improbable, the resistance of this body according to the Experiments of 1798 being equal to 195.77 lbs. But to proceed: it is to be remarked that the retardation of the cylinder exceeds the opposition of a sphere by 123.82 lbs. (p. 452 and 474); that is to say, a globe experiences about one-third the resistance of a cylinder, a fact very different from the conclusions drawn by theoretical writers on the law of resistance, as will appear by turning to any of the many books written on this subject.

By comparing the resistance of the cylinder U with the Experiments made with figure W, it is concluded, that adding a semi-globe to the hindmost or after extremity decreases the minus pressure, at a velocity of 13.527 feet per second, 23.19 lbs. (p. 452 and 459).

Again, by collating the Experiments of U with those made with body X (which is cylinder U increased by the addition of a half-sphere to its head or foremost extremity), the resistance is decreased 136.23 lbs.; the sum of these two numbers amounts to 159.42 lbs.; being the decrease of the retardation.

Thirdly, by comparing the Experiments made with U, with those of the cylinder U lengthened by a semi-sphere at each end called Y (p. 468), the diminution of the resistance appears to be 136.96 lbs. which falls short of the decrease determined by the first made 22.46 lbs.; the cause of this non-agreement we are at a loss to conjecture.

The last experiments to be compared are those made with the sphere Z (p. 474), with those made with cylinder U, augmented in length by a half-globe at each of its ends (p. 468). The globe Z is retarded with a force equal to 62.85 lbs., but the other figure with a resistance of 49.71 lbs., the difference being 13.14 lbs.; a remarkable circumstance, that a globe cut in halves and separated by the intervention of a cylinder, whose base and length are the same as the diameter of the sphere, should diminish the resistance nearly one-fifth part.

* From Mean Resistance 196.24 (page 445), deduct the Plus and Minus Pressures 186.67 (page 452), and there remains 9.57 lbs.

CHAP. X.

CONCERNING THE EXPERIMENTS MADE IN THE YEAR 1798.

THE first set of experiments to be examined are those made for determining the friction of water on fifty superficial feet, page 487, which Table contains the mean of the Experiments made for ascertaining this point. At the bottom of the page is set down the law of the friction, by which it is evident, the friction is less than the square of the velocity, the mean being 1.94913.

The next set are those made with the body **Ao**; by which it also appears, that the plus pressure is not in proportion to the square of the velocity, it being less, and it also decreases, the average decrease being .0295; of course, this law will nearly apply to all the bodies **Aa**, **Ab**, **Ac**, **Ad**, **Ae**, **Af**, **Ag**, **Ah**, and **Ai**, because the head-end or foremost extremity of each is of the same shape.

CHAP. XI.

ON THE LAW OF THE MINUS PRESSURE.

HAVING, in the last chapter, investigated the law of the plus pressure, the present will be appropriated to the purpose of finding the law of the minus pressure; and, with that view, the body **Ai** will be taken. By inspecting the Table at the foot of page 563, the minus pressure is (as was the case with the plus pressure) less than the square of the velocity, and the law decreases as the velocity increases.

It has been already observed, that the law of the minus pressure of a square after-end was regular as far as a velocity of ten feet per second, and the correction necessary to be applied for continuing this regularity has been given, as well as the error in the Experiments pointed out, consequently it is useless to recapitulate the circumstances. For this reason, the Experiments made with **Ah**, or a compound figure whose after or stern end is a semi-cylinder, will be next examined; in this case, the minus pressure is greater than the square of the velocity, the mean of the powers being 2.0858, excluding the power calculated with the motive weight answering to eight feet per second, which should have been 4.9949 instead of 4.703; in which part of the calculation or experiment this error of $\frac{3}{10}$ of a lb. lies, would require more trouble and time to ascertain than the investigation deserves; it is, however, extremely probable, that there has been a transposition of a figure in some part of the work.

By proceeding in the same manner, the minus pressure of the bodies **Ag**, **Af**, **Ae**, **Ad**, **Ac**, **Ab**, and **Aa** will be determined. The results being annexed to the bottom of the different pages which contain the results of the various Experiments, the memoranda inserted at the bottom of the Tables will, in general, be fully sufficient to mark the irregularities of those powers which are rejected; but, with respect to body **Ac**, there appears to be a crossing in the minus pressure; that is to say, the minus pressure increases to the velocity of nine feet per second, and afterwards continues to diminish. Whether this cause is to be attributed to the shape of the stern-end, or to an error in the Experiments, we will not attempt to determine.

CHAP. XII.

ON THE LAW OF THE PLUS PRESSURE.

HAVING treated somewhat copiously in the last chapter on the minus pressure, the present will be occupied by examining the plus pressure. With this intention, the body **Ai** will be the first taken. By inspecting the Table, the law of the plus pressure, at the lowest celerity, is somewhat greater than the square of the velocity, and gradually decreased to the end of the Table; and the same observation, with respect to the decrease, is applicable to the other bodies **Ba, Ca, Da, Ea, Fa, Ga, Ha, Ia,** and **Io.**

With respect to the plus and minus pressure of **Ai** (p. 563) with a velocity of 13.527 feet per second, it agrees extremely well with the resistance of the triangle **M** (see page 421), the resistance of the former being 56.29 lbs. and the latter 58.85 lbs.; but from this quantity is to be subtracted 1.95 lbs., the friction of the upper and under surface, which reduces the quantity to 56.90; thus, the difference between the two results is 0.61.

By comparing figure **Ia** (p. 617) at the same velocity with the figure in page 425, the resistance of the former is 150.81 lbs., whilst the retardation of the latter is 191.99—1.95 = 190.04; in this case, the non-agreement is no less than 39.23. Now, as the two solids differ nowise in form from each other, excepting that **Ia** has a cube joined to its base or foremost extremity, the deviation may probably proceed from this circumstance.

In a former chapter it was remarked, that a sphere experienced less resistance when divided into equal parts, and lengthened by the insertion of a cylinder, than it did in its original form; the resistance in the latter instance at 13.527 feet being 62.85 lbs., and in the former case 49.71 lbs.; if the cube has the same effect in diminishing the resistance of the triangle as the cylinder had on the globe, 150.81 lbs. (the resistance of **Ia**), being multiplied by 62.85, and divided by 49.71, it should be equal to the experimented retardation; now, the quotient of this division is 190.69, and the resistance of the base of the triangle, or figure **M** (page 425), was 190.04,* a most remarkable coincidence, and which incontestably proves the wonderful advantage of length in diminishing resistance.

* The Resistance and Friction of Triangle **M** (page 425) is 191.99 at 13.527 feet per second; deduct for Friction of upper and under surface 1.95 = 190.04.

By deducting the friction on the total surface of the body Ia and the minus pressure, the plus pressure will be reduced to 142.57; if this number be afterwards reduced in the proportion of radius to the sine of the angle of incidence, and the result afterwards compared with the experimented resistances of the bodies **Fa**, **Ea**, **Da**, and **Aa**, (the friction on the whole surface being first deducted), the agreement or the disagreement of this theory will be seen by inspecting the subsequent Table.

	Incidence.	Plus Pressure by calculation.	Ditto by experiment.	Differences.
	° ′ ″			
Head ends A	9 35 40	23.76	23.18	+0.58
——— D	14 28 40	35.64	36.40	−0.76
——— E	19 28 16	47.52	37.91	+9.61
——— F	30 0 0	71.21	47.83	+23.45

Hence, it appears this theory is sufficiently accurate, the obliquity being small, but erroneous, when large.

* 47.83 deducted from 71.21 leaves 23.38; which shows that Captain Scott has made a mistake of a figure in copying one of the two preceding columns, or in the subtraction.

CHAP. XIII.

ON THE ADVANTAGES OF CURVED LINES.

HAVING examined and compared the Experiments made with solids whose foremost extremities, or head ends, were formed of right lines, it is necessary, with a view of completing the remaining part, to consider what advantages are obtained by using curved lines. The plus pressure of the solid **Fa** is 47.12 lbs. at a velocity of 13.527 feet per second, and the plus pressure of **Ga**, 33.87 lbs., the difference being equal to 3.25 lbs., which is a diminution of between $\frac{1}{14}$ and $\frac{1}{13}$ part.

By comparing **Fa** with **Ha**, it is observable that the latter is less resisted by 3.91, which is nearly a decrease of $\frac{1}{11}$ of the resistance; a convincing proof of the advantage curved lines have over rectilineal ones in dividing the fluid, and this circumstance strongly corroborates the assertion made by many professional men, that a full bow has the preference to a lean one in point of sailing; but it is to be understood that the bow should be made nearly circular to gain this superiority.

CHAP. XIV.

ON THE FINDING THE PLUS AND MINUS PRESSURES.

By referring to the bodies Ao (p. 509) and Aa (p. 514), it will be seen that these two solids had each of them the same head-ends, the same middle part, but different stern-ends, the oblique side of the stern part being nine times the half breadth of Ao, whilst that of Aa was no more than six-fold; the same remarks are applicable to Ho (p. 610), Ha (p. 603), and Ia (p. 617).* Now, as each set of Experiments exhibits but a small difference in the resistance of the long and short stern-ends, it was concluded that the minus pressure of the long stern-end was so small, that it might be safely neglected; and as the Experiments made with Ho and Ha appear to be the most regular, they were considered as furnishing the best data for calculating the minus pressure at the different degrees of celerity. Having once determined the minus pressure, as well as the friction, the sum of these two quantities being added together, and subtracted from the total resistance, the remainder left the head resistance.

To obviate objections that might be made against the accuracy of the above conclusions, the following Experiments were made with the bodies Hi (p. 635), iH (p. 642), and H (p. 650). Now, it is evident that if the plus pressure of a square head-end like i, and the minus pressure of a semi-circular after-end have been determined, the aggregate of these two resistances ought to be equal to the plus and minus pressure of iH, or, what is the same thing, as the total resistance of iH minus the friction.

By a similar mode of proceeding, the head pressure of a semi-circular fore-body, and the minus pressure of a square after-body, are checked by the Experiments made with Hi; and, lastly, the head and minus pressure of a semi-circular head and stern are verified by the Experiments made with H.

* For reference to the Bodies in this and the following page, see GENERAL TABLE for 1798, page 688.

With regard to the Experiments made with the bodies L, aL, La, and aLa, there is great reason for believing that the Experiments made with the cylinder L are far more accurate than those made in the year 1797, and ought, therefore, to be used in making comparisons; with respect to the other Experiments, it will be as well to take a mean of those made in 1798, and those made in 1797, for the true result; and which is done at the bottom of the Tables of 1798.*

* By way of illustration is subjoined, a short paper written by Colonel BEAUFOY for Dr. BURNEY's edition of *Falconer's Marine Dictionary*, 1815 (Article, "Resistance of Fluids," p. 400), on the method of ascertaining the resistance of water on the fore part or bow of a vessel, as well as the minus or negative pressure on the stern.

"By referring to bodies Ao and Aa, it will be seen that these two bodies have the same fore and middle parts, but different stern-ends. The stern-end of Ao being nine times the semi-diameter of the body, and the stern-end of Aa only six times the semi-diameter. Now it is evident that, as these two bodies have similar fore and middle bodies, the difference of the resistance between them, after the friction is deducted, must arise from the difference of the after-pressure.

TABLE I. line 1, contains the total resistance of Ao.
line 2, contains the friction, which being deducted leaves in
line 3, the plus and minus pressure.

TABLE II. line 1, contains the total resistance of Aa.
line 2, contains the friction, which being deducted, leaves in
line 3, the plus and minus pressure.
line 4, contains the plus and minus pressure of Ao.
line 5, contains the difference between the minus pressure of Ao and Aa, which is found not to be materially different. The minus pressure of Ao may therefore be considered as nothing.

But, as more difficulty is experienced in making accurate Experiments with right-lined and acute fore bodies than with curved ones, recourse was had to the bodies Ho and Ha. These bodies, as in the former case, have the same shaped (semi-circular) fore and middle bodies, but different shaped sterns; the shape of the after-part being like those in the former Experiments.

TABLE III. line 1, contains the total resistance of Ho.
line 2, contains the friction, which being deducted, leaves in
line 3, the plus and minus pressure.

TABLE IV. line 1, contains the total resistance of Ha.
line 2, contains the friction, which being deducted, leaves in
line 3, the plus and minus pressure.
line 4, contains the plus and minus pressure of Ho.
line 5, contains the difference between the plus and minus pressure of Ho and Ha, or the minus pressure of Ha, which, being deducted from line 3, leaves in
line 6, the plus pressure of Ha.

The minus pressure of Ha is used in the calculations.

The figure Ai has the same shaped fore and middle body as figures Ao and Aa, with the stern part taken away. By proceeding in the manner as in the other tables, the minus pressure was found as is set down in Table V.

TABLE V. Figure Ah is the body Ha reversed; that is to say, the stern of Ha, in this case, is made the bow or fore-part of Ah, and the bow of Ha the stern of Ah.

TABLE VI. line 1, contains the total resistance of Ah.
line 2, contains the friction.
line 3, the plus and minus pressure.
line 4, the plus pressure, which, being deducted, leaves in
line 5, the minus pressure.

For the purpose of determining the accuracy of the above-mentioned results, Experiments were made with the body H; the fore-part of H has the same bow as Ha, and the after-part is the stern end of Ah. It is evident, if to the resistance of the bow Ha, we add the minus pressure of Ah, the sum should be the resistance of H, after deducting the friction.

TABLE VII. line 1, contains the total resistance of H.
line 2, contains the friction.
line 3, plus and minus pressure.
line 4, plus pressure of Ha.
line 5, minus pressure of Ah.
line 6, the sum of the two pressures, or the plus and minus. The pressure of the body H, as determined by the Experiments made with the bodies Ha and Ah.
line 7, contains the plus and minus pressure of H, being determined by the Experiments made with that body.
line 8, contains the difference between the two results, which agree as nearly as could be reasonably expected, considering the nature of the Experiments."

N.B. The several Bodies referred to in this Note and in the succeeding Table are enumerated in the GENERAL TABLE, p. 688; and their dimensions in detail will be found in the following pages, viz.

Ao . . . . . 509 } and PLATE XIV.
Aa . . . . . 514 }
Ho . . . . . 610 } and PLATE XVI.
Ha . . . . . 603 }
Ai . . . . . 563 } and PLATE XV.
Ah . . . . . 555 }
H . . . . . 650 and PLATE XVI.

		"Feet per Second."											
Direction of Motion. Horizontal Sections.		1	2	3	4	5	6	7	8	9	10	11	12
	TABLE I.												
	From the total resistance in lbs. avoirdupois .	0.2937	1.1616	2.5584	4.442	6.776	9.524	12.657	16.145	19.958	24.075	28.47	33.11
	Subtract friction	0.0425	0.1634	0.3583	0.625	0.963	1.371	1.846	2.389	2.999	3.675	4.41	5.22
	Remains plus pressure	0.2512	0.9982	2.2001	3.817	5.813	8.153	10.811	13.756	16.959	20.400	24.06	27.89
	TABLE II.												
	From the total resistance in lbs. avoirdupois .	0.2517	1.0237	2.2996	4.056	6.273	8.930	12.004	15.479	19.336	23.559	28.13	33.03
	Subtract friction	0.0368	0.1417	0.3109	0.542	0.836	1.189	1.602	2.073	2.602	3.188	3.83	4.53
	Remains plus and minus pressure	0.2149	0.8820	1.9887	3.514	5.437	7.741	10.402	13.406	16.734	20.371	24.30	28.50
	Plus pressure of A o	0.2512	0.9982	2.2001	3.817	5.813	8.153	10.811	13.756	16.959	20.400	24.06	27.89
	Difference of minus pressure A o and A a	+.0363	+.1162	+.2114	+.303	+.376	+.412	+.409	+.350	+.225	+.029	−.24	−.61
	TABLE III.												
	From the total resistance in lbs. avoirdupois .	0.2706	1.1089	2.5050	4.441	6.898	9.857	13.300	17.210	21.569	26.373	31.59	37.21
	Subtract friction	0.0344	0.1323	0.2902	0.506	0.780	1.110	1.495	1.935	2.429	2.976	3.58	4.23
	Remains plus pressure	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.397	28.01	32.98
	TABLE IV.												
	From the total resistance in lbs. avoirdupois .	0.2698	1.1069	2.5026	4.440	6.900	9.867	13.321	17.244	21.622	26.442	31.69	37.34
	Subtract friction	0.0288	0.1107	0.2427	0.423	0.653	0.928	1.250	1.619	2.032	2.489	2.99	3.54
	Remains plus and minus pressure of H a	0.2410	0.9962	2.2599	4.017	6.247	8.939	12.071	15.625	19.590	23.953	28.70	33.80
	Subtract plus pressure of H o	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.397	28.01	32.98
	Remains the minus pressure of H a	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82
	Which *subtracted* leaves the plus press. of H a	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.397	28.01	32.98
	TABLE V.												
	Minus pressure of A i.	0.1629	0.6278	1.3668	2.361	3.591	5.045	6.707	8.563	10.607	12.820	15.220	17.90
	TABLE VI.												
	From the total resistance in lbs. avoirdupois .	0.3054	1.2544	2.8394	5.043	7.847	11.232	15.180	19.678	24.702	30.250	36.29	42.81
	Subtract friction	0.0288	0.1107	0.2427	0.423	0.653	0.928	1.250	1.619	2.032	2.490	2.99	3.54
	Remains plus and minus pressure	0.2766	1.1437	2.5967	4.620	7.194	10.304	13.930	18.059	22.670	27.760	33.30	39.27
	Subtract plus pressure of A a	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.056	16.284	19.815	23.61	27.68
	Remains minus pressure . . . . . *	0.0665	0.2813	0.6531	1.188	1.886	2.755	3.794	5.003	6.386	7.945	9.69	11.59
	TABLE VII.												
	From the total resistance in lbs. avoirdupois .	0.3406	1.3965	3.1586	5.608	8.723	12.486	16.874	21.873	27.461	33.63	40.35	47.61
	Subtract friction	0.0207	0.0796	0.1746	0.304	0.469	0.668	0.900	1.164	1.461	1.79	2.15	2.54
	Remains plus and minus pressure	0.3199	1.3169	2.9840	5.304	8.254	11.818	15.974	20.709	26.000	31.84	38.20	45.07
	Add to plus pressure of body H a	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.397	28.01	32.98
	Minus pressure of body A h	0.0665	0.2813	0.6531	1.188	1.886	2.755	3.794	5.003	6.386	7.945	9.69	11.59
	Sum is plus minus pressure of H	0.3027	1.2579	2.8679	5.123	8.004	11.502	15.599	20.278	25.526	31.342	37.70	44.57
	Plus and minus pressure of H.	0.3199	1.3169	2.9840	5.304	8.254	11.818	15.974	20.709	26.000	31.840	38.20	45.07
	Difference of results by experiments	0.0172	0.0590	0.1161	0.181	0.250	0.316	0.375	0.431	0.474	0.498	0.50	0.50

* The head pressure is found by subtracting the minus pressure of H a from the plus and minus pressure of A a, exam. 28.50−82=27.68.

N.B. The middle part of each body was a cube of 12 inches. The sharp ends are triangles, and the circular ends semi-cylinders; and the centre of each body was immersed six feet below the surface of the water. The minus pressure of A o is considered as nothing."

CHAP. XV.

EXAMINATION OF THE GENERAL LAW OF THE EXPERIMENTS, AND THE METHOD OF CALCULATING.

PROFESSOR HUTTON'S mode of finding the general law of the Experiments, as well as the method of calculating: for this purpose the set of Experiments made with parallelopipedon a (see page 74), will be taken.

	lbs. oz. drs.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
Motive forces.	2 1 8	4 3	8 6	16 12	33 8	67 0	100 8	134 0
Velocities per second.	1.0502	1.4858	2.1018	2.9733	4.2061	5.9500	7.2885	8.4170

First, try in what powers of the velocities the several motive forces or resistances are; namely, by comparing together every two Experiments; that is, first the 2 lbs. 1 oz. 8 drs. with every weight or resistance that follows it; then 4 lbs. 3 oz. with every weight following it; then 8 lbs. 6 oz. with every weight following it; and so on, till every combination of two's has been made. This examination may be best made in a manner similar to Mr. GARNETT'S theorem.

$$V^m : v^m :: R : r$$
$$v^m \times R = V^m \times r$$
$$\log. v \times m + \log. R = \log. V \times m + \log. r$$
$$\log. v \times m - \log. V \times m = \log. r - \log. R$$
$$m = \frac{\log. r - \log. R}{\log. v - \log. V};$$

or,

$$\frac{V^m}{v^m} = \frac{R}{r}$$
$$\log. V \times m - \log. v \times m = \log. R - \log. r$$
$$m = \frac{\log. R - \log. r}{\log. V - \log. v}$$

Digitized by Google

EXPONENTS.

lbs.	oz.	drs.		lbs.	oz.	
2	1	8	and	4	3	1.8157
				8	6	1.8314
				16	12	1.8856
				33	8	1.9248
				67	0	1.9570
				100	8	1.9733
				134	0	1.9705
4	3	0	and	8	6	1.8472
				16	12	1.9225
				33	8	1.9642
				67	0	1.9956
				100	8	2.0114
				134	0	2.0046
8	6	0	and	16	12	2.0043
				33	8	2.0284
				67	0	2.0506
				100	8	2.0626
				134	0	2.0483
16	12	0	and	33	8	2.0530
				67	0	2.0745
				100	8	2.0860
				134	0	2.0634
33	8	0	and	67	0	2.0964
				100	8	2.1073
				134	0	2.0686
67	0	0	and	100	8	2.1263
				134	0	2.0461
100	8	0	and	134	0	1.9327

By applying this rule to all the above numbers, first 2 lbs. 1 oz. 8 drs. to all the rest; then 4 lbs. 3 oz. to all the rest; and so on, the several values of m, or exponents of the power, come out as per margin.

These values of m, or the exponents of the power, it is evident are various, contained between 1.8157 and 2.1263, shewing that the Experiments are not very regular. It may be adviseable, therefore, to take a medium among them all, and by means of it to reduce the experimented numbers to a more regular series. For this purpose adding together all these 28 exponents, and dividing the sum by 28 (the number of them), the quotient is 1.9983, which may be considered as the medium value of m.

Now, the nearest calculated exponent to this is 1.9956, found from the numbers 4 lbs, 3 oz. and 67 lbs.; hence, it is probable that these two numbers, 4 lbs. 3 oz. and 67 lbs., are the best two Experiments in the whole set. Assuming, therefore, either of these two terms, 4 lbs. 3 oz. or 67 lbs., and their correspondent velocities, 1.4830 or 5.950, and from thence computing the velocities answering to all the other weights, 2 lbs. 1 oz. 8 drs., 8 lbs. 6 oz., 16 lbs. 12 oz., &c. the unavoidable irregularities in the Experiments will be corrected, and the velocities will be brought into a regular series.

Computing them then in this way, they come out as follows, where the deficient velocity of 1 lb. 12 drs. is also supplied:

	lbs. oz. drs.	lbs. oz. drs.	lbs. oz. drs.	lbs. oz. drs.	lbs. oz. drs.	lbs. oz. drs.	lbs. oz. drs.	lbs. oz. drs.
Resistance	1 0 12	2 1 8	4 3 0	8 6 0	16 12 0	33 8 0	67 0 0	100 8 0	134 0 0
Velocities.	.....	1.0502	1.4858	2.1018	2.9733	4.2061	5.9500	7.2885	8.4170

All which velocities are computed by this theorem, viz.

$v = V \times \sqrt[m]{\frac{r}{R}}$; or $\log. v = \log. V - \frac{\log. R - \log. r}{m}$. Wherein $R = 67$, $r = 2$ lbs. 1 oz. 8 drs., $m = 1.9983$, and $V = 5.950$.

$R = 67$ log. 1.8260748
$-r = 2.1.8$ 0.3209145 77452 log. $V = 5.95$
$m = 1.9983$) 1.5051603 (.75322
1.39881 .02130 = 1.0502 nat. numb., the velocity answering to 2 lbs. 1 oz. 8 drs.
106350
99915
64353
59949
44040
39966
40740
39966
774

Or, the calculation may be done entirely by logarithms, $\log. v = \log. R - \log. r$ = logarithm of the logarithm $- \log. m$ = logarithm of a natural number to be subtracted from the log. of V.

EXAMPLE.

$R = 67$ log. 1.8260748
$r = 2.1.8$. do. 0.3209145
1.5051603 log. 0.1775942
$m = 1.9983$ log. 0.3006607
1.8769335 = nat. numb. 0.75324
$V = 5.950$ log. 0.7745170
0.0212770 = 1.0502 feet.

Should it be required to find the resistance answering to any given velocity,

$R = \frac{V^m}{v^m} \times r$, or the logarithm of $R = \log. r \times \frac{V^m}{v^m}$

$V = 5.950$ log. 0.7745170
$v = 1.0502$ do. $-$ 0.0212720
0.7532450
1.9983
22597350
60259600
67792050
67792050
7532450
1.50520948350
$r = 2.1.8$ log. 0.3209145
$R = 67$ 1.8261239

or thus:

$V = 5.950$ log. 0.7745170
$v = 1.0502$ do. 0.0212720
0.7532450 log. = 1.8769334
$m = 1.9983$ log. = 0.3006607
0.1775941 n. n. 1.5052
$r = 2.1.8$ log. = 0.32091
$R = 67$ 1.82611

CHAP. XVI.

DESCRIPTION OF THE APPARATUS.

The Apparatus consists of a three-legged stand (Fig. 1, Plate I. and Fig. 1, Plate II.), the legs of which are each about sixty feet in length and one foot six inches square, and connected at the top by a three inch bolt A B, from which are hung the four bolts D, E, F, G, having an eye at each of their ends, through the lower of which passes the three inch bar D G, for the purpose of appending six blocks, that correspond to five similar blocks, fastened to the bar H I, upon which chains are fixed to suspend the box K, made to contain the weights which may be necessary to draw the experimental body through the water. The eleven blocks just mentioned have each a brass shiver L M (Fig. 2, Plate II.) of thirteen inches diameter, with a steel pin fastened in the middle of the shiver, so that both the shiver and pin revolve together, by which means the shiver is prevented from ever touching the cheeks of the block: the ends of the pins work on Mr. Garnett's patent rollers, fitted in containers made spherical, so that they may move freely, in order always to insure the pin a fair bearing on the rollers.*

A four strand rope of an inch diameter, made of the best hemp, is reeved through the blocks (Fig. 1, Plate II.) in such a manner that the standing and running parts go first through the middle blocks N O, by which means the box of weights K is always kept horizontal, as will readily appear upon inspection of the figure. The running part of the rope which comes down from the above-mentioned block O passes under a vertical wheel P (Plate I. and Figs. 3 and 4, Plate II.) of fourteen feet circumference, the frame of which is fastened to the ground (Fig. 4, Plate II. corresponding to P in Plate I. and Fig. 3, in Plate II.), and from thence horizontally to the body on trial. The standing part of the rope passes round the barrel of a crab W (Plate I.), by which a horse winds up the box of weights K. The running part of the rope leads immediately from the wheel P (Plate I.) to the floating body (suppose R) on trial; and the tension of the rope, that is the actual power employed to give the body the velocity required, has been as

* In Plate IV. (Figs. 1 and 2), we have given an end and side view of the full size of one of Mr. Garnett's patent rollers; Fig. 3, exhibits the friction rollers detached from the frame. It may be necessary to observe, that the centres of all the blocks made use of in these Experiments were constructed with friction rollers upon Mr. Garnett's principle. Various modifications of these rollers are represented in Figs. 4, 5, 6, 7, and 8, on a smaller scale.—Ed.

repeatedly ascertained as any alteration of circumstances rendered such examinations requisite. By calculation, it is evident that the tension, independent of friction, must have been always equal to $\frac{1}{7\frac{1}{2}}$ of the weight of the box **K**, bolts, lower blocks, chains, &c.; for the power is to the weight as units to twice the number of moveable blocks.

The friction of the ropes, pullies, &c. was determined in the following manner: weight was gradually fastened to the fall or running part of the rope, till it became just sufficient to make the box of weights **K** ascend gently. This done, the counterpoise which was fastened to the running end of the rope was gradually diminished, until the box **K** began to descend gently. Then, half of the difference of those two weights, viz. of that which was a little more, and of that which was a little less, than sufficient to counterbalance the box of weights **K**, was considered as the obstruction occasioned by the friction of blocks, rope, &c., and when the body under trial did not from its form preserve a direct course, a thin piece of board, about four feet long and eight inches wide, was applied as a rudder, which produced the desired effect, at the same time that it added very little to the friction of the water. And, in order to measure the velocity of the body on trial, on the axis **Q** of the wheel **P** (Fig. 3, PLATE II.), answering to the wheel **P** (Fig. 1, PLATE I. and Figs 3 and 4, PLATE II.), there is a groove or swage to receive a thin silken line, leading from thence round two small brass pullies to a cylinder **S**, placed horizontally, which partakes, by means of that line, of the motion of the axis **Q** upon the surface of the cylinder. A spiral groove was turned in order to receive another small silken line, that was fastened to a thin fir batten, sliding in a groove in the scale **TV**, made on the edge of a long deal board, on which edge the scale is graduated by actual admeasurement, so that the sliding batten moves one inch for every foot run through by the body on trial: and near the end **T** of the scale, a machine **X**, worked by a pendulum, is so contrived as to cause by a spring a pencil to leave a mark on the sliding batten at the end of every two, three, or indeed at the end of any number of seconds, according as the machine is set; of course, therefore, the space described in those times by the body on trial must be accurately shewn by the respective distances of the pencils marks from each other on the batten.

It having been observed that the body, in the beginning of its motion, when at a much slower rate than the velocity which it acquired afterwards, and which continued nearly for the remainder of its course, it was thought necessary to increase the moving power in the beginning only, so as to enable the body to acquire that uniform velocity much sooner; and this was effected in

the following manner: an iron ball, weighing about 1800 lbs., was suspended to the box **K**, at some distance below it, by means of a long rope, so that the body, in the beginning of the motion, was acted upon both by the weights of the box **K** and of the iron ball; but, as the ball came to the ground much sooner than the box, its action was of course suspended after a certain period; and, for the sake of accuracy, even the long rope which supported the iron ball was, by means of a particular contrivance, discharged from the box **K** the moment in which the iron ball touched the ground.

IMPROVEMENTS AND ALTERATIONS IN THE APPARATUS PREVIOUS TO THE EXPERIMENTS MADE IN THE YEARS 1796, 1797, AND 1798.

The scale, instead of being at right angles to the wheel under which the rope passed, was placed parallel to it, and the cylinder (which in these Experiments was larger than that used before) was fixed to the arbor of the wheel by an iron axis, and the helix was square instead of triangular.

To keep the silken line which drew the batten, or thin piece of wood on which the pencil marked, always of an equal tension, we placed at the end of the trough in which the batten slid, a double cylinder, bearing a proportion to each other nearly as one to seven; round each of these cylinders a silken line was wound, the end of that on the larger was fastened to the hind part of the batten, and to that on the smaller cylinder a 4 lbs. weight was hung; this was called the retarding weight, and was designed to correct the irregularity, which we had sometimes remarked during our former Experiments, in the movement of the batten, when its progress was obstructed by sand or any other small substance.*

The scale was graduated by the following method: a piece of fine wire was wound round the periphery of the large wheel† once, and fourteen times in the helix of the cylinder; the first wire was found to measure 13 feet 10.7 inches; the second 19 feet 11.9 inches; consequently, one revolution was one foot 5.1357 inches; then by the annexed proportion will be found the space on the scale answering to 14 feet.

Feet.	Inch.	Foot.	Inch.		Feet.	Foot.	Inch.
As 13	10.7	: 1	5.1357	::	14	: 1	5.269,

the space on the scale to be divided into 14 equal parts.

* The trough not being sufficiently elevated above the ground, the line attached to the small cylinder passed through a small brass pulley, to which was hung an 8 lbs. weight.

† This wheel was made so light that we found, from repeated observations, that no error arose in the Experiments from its acting as a fly.

A certain number of divisions, each equal to 1 foot 5.269 inches, were then set off along the scale with a pair of beam compasses; these divisions were again divided into fourteen equal parts, and each fourteenth into ten, and the parts of this last division were still large enough to be divided by the eye into tenths; thus each foot may be said to contain 100 divisions, consequently when the moving body was drawn with a celerity of ten feet per second, this small portion of time was accurately divided into 1000 equal parts.

The silken twist intended to draw the batten, was wound fourteen times in the helix of the cylinder, and being measured gave 19 feet 11.33 inches; whereas the wire gave 19 feet 11.9 inches; consequently to correct the error arising from the difference of size between the silk and wire, the feet and decimal parts of a foot read off the scale, must be multiplied by 239.9 and divided by 239.33.

Four different sized lines were used to draw the bodies through the water. No. I., or the largest, measured in diameter 0.355 parts of an inch; No. II. 0.237; No. III. 0.185; No. IV. 0.041, or the same size as the wire; here likewise a second correction must be made for the semi-diameter of the lines above that of the wire: and after the first correction has been applied, the result, where line I. is used, must be multiplied by 167.6807, and divided by 166.7, or increase the divisions by $\frac{2}{100}$ parts of the whole, and the same result is obtained; when line II. is used, the divisions after the first correction must be increased by $\frac{1}{100}$ of the whole; line III. by $\frac{1}{1000}$; but line IV. requires no other correction than that made for the excess of the thickness of the wire above the silken line, which is $\frac{4}{1000}$ of the number of divisions read off the scale.

Previous to these Experiments, the clock was regulated by an accurate astronomical time-piece, keeping mean time; and to prevent any accidental alteration in the pendulum, the bob and rod were connected firmly together by a screw. By a simple contrivance, the pendulum was drawn as much from a perpendicular, as was equal to half its arch of vibration, and then suddenly let go on the body's commencing its motion.

It may not be improper to mention, that in this year's Experiments (1797) a chain* was used for an accelerating weight: the former mode of hanging on a given number of pounds being found to give a tremulous motion to the line which drew the body, on the weights suddenly coming to the ground; the gradual diminution of the chains weight effectually removed this inconvenience.

* The length of the chain was 12 feet 6 inches.

PLATE III. represents the apparatus in its improved state: Fig. 1, the three legged stand. **A**, is an end view of the wheel, iron axis, and the cylinder on which the silken line wound itself that drew along the batten. Fig. 7, (PLATE IV.) the top and bottom pullies, to the lower of which was hung the weight **K**, and to which was attached the chain. **C**, (PLATE III.) is a drawing of the scale, clock, and part of the trough in which the batten slid: the line projecting over the broken end represents a part of it. **D**, the end of the trough, with the double cylinder, and retarding weight **P**. **E**, the horizontal view of the double cylinder, to the smaller part of which was attached one end of the line that supported the retarding weight **P**. Fig. 6, (PLATE IV.) the smaller pullies, used when the motive weights were less than twelve pounds. Fig. 7, (PLATE IV.) the larger blocks, used when the motive weights exceeded twelve pounds: both these pullies were two-fold.*

PLATE V. Fig. 1, exhibits a view of the Conductor made use of during the years 1796, and 1797. **A**, is the lid of the recess **B** for holding the ballast; **C**, is the body under trial. Figs. 2 and 3, shew the mode by which the different head and stern ends were attached thereto: a, (Fig. 3,) is the rudder. Fig. 4, represents the slings by which the Conductor was lifted out of the water for the purpose of shifting the bodies. Figs. 5 and 6, shew the wedges by which the bar was fixed at the different depths of three, six, and nine feet.

Upon placing in succession the wood engravings of the different bodies, in order to form an INDEX, it was evident that several of the figures were drawn upon various scales, many of them differing both in size and shape, although of the same dimensions. This, no doubt, arose from their having been drawn at different times during the space of ten years; but the dimensions and angles being expressed in every page where the figures occur, renders the incorrectness of their delineation of little consequence. To prevent, however, any misconception as to the shape of the bodies, all the figures have been redrawn, and are inserted at the end of the volume by way of INDEX to the bodies upon which experiments were made. PLATES VI. to X.† are drawn on a scale of one-tenth of an inch to a foot, and PLATES XI. to XVI. on a scale of two-tenths of an inch to a foot. All the figures in the INDEX are drawn in isometrical perspective.

* We found Experiments made with a system of pullies equally accurate with those made with a single line.

† The figures in pages 300 and 312 do not seem to convey an accurate idea of the true position of the two square planes as given in the description; on redrawing the figures for the INDEX (PLATE X.) the presumed error in the original drawing has been corrected.—ED.

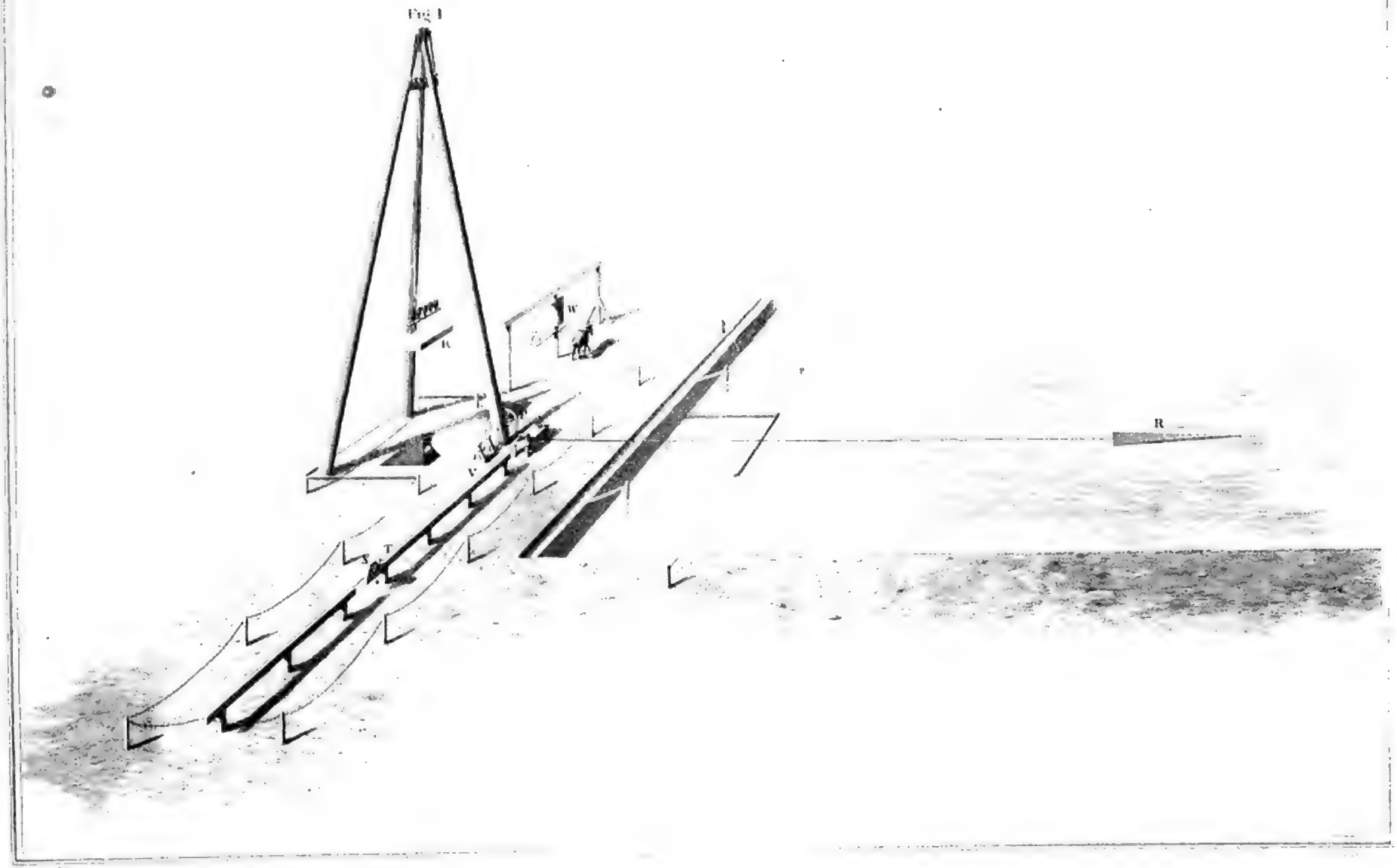
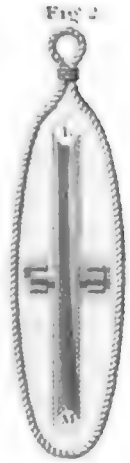
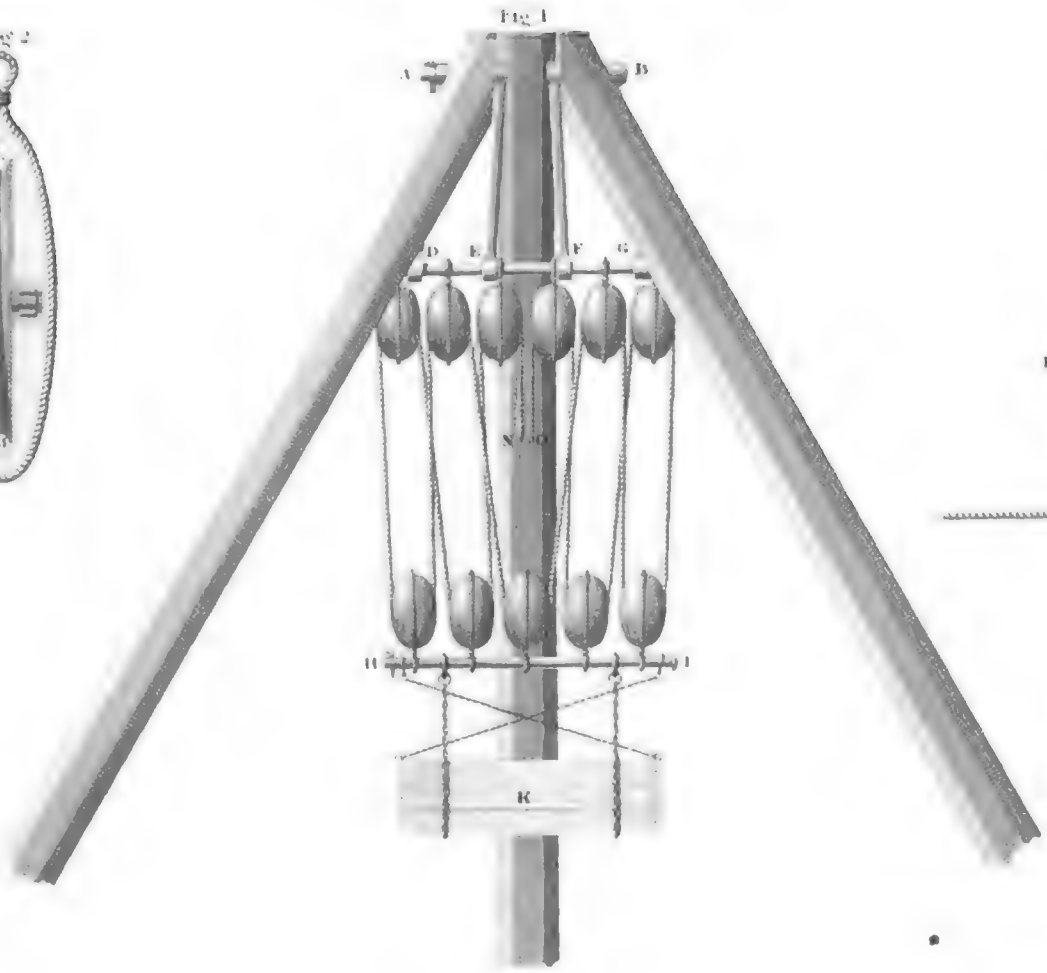
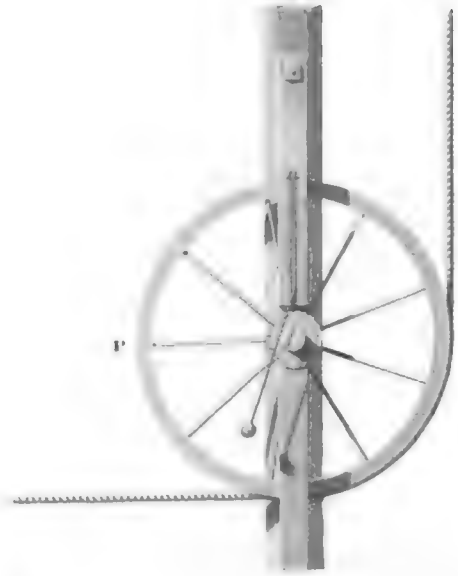


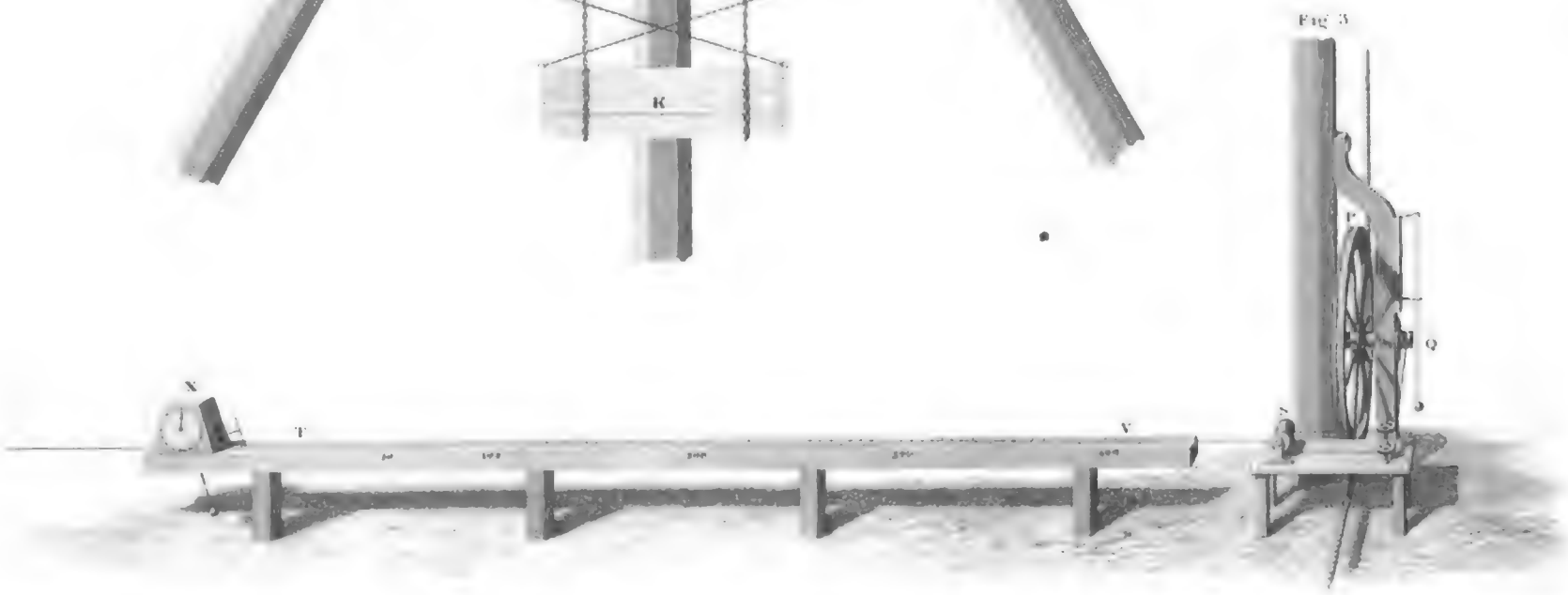
Fig. I
R

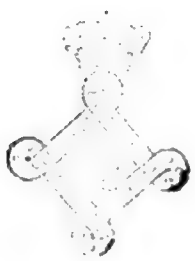
Digitized by Google





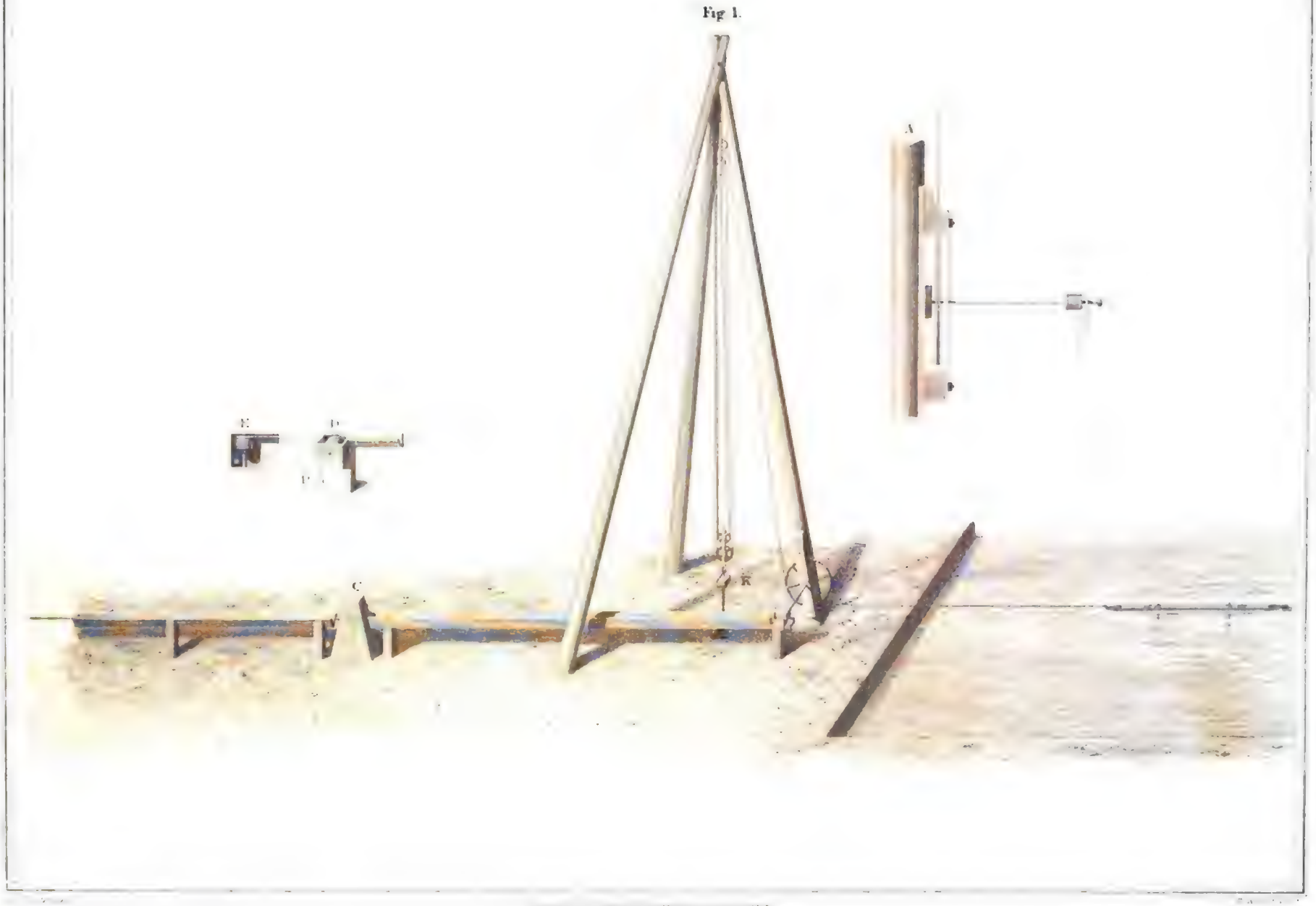






Digitized by Google

Fig 1.



Digitized by Google

Fig. 1

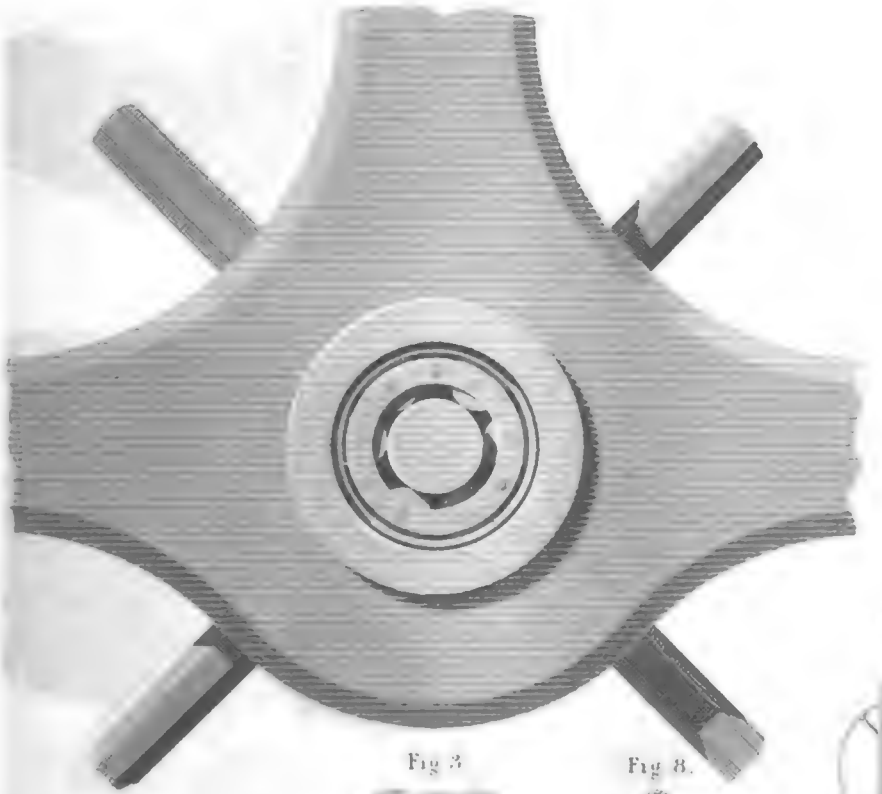


Fig. 2

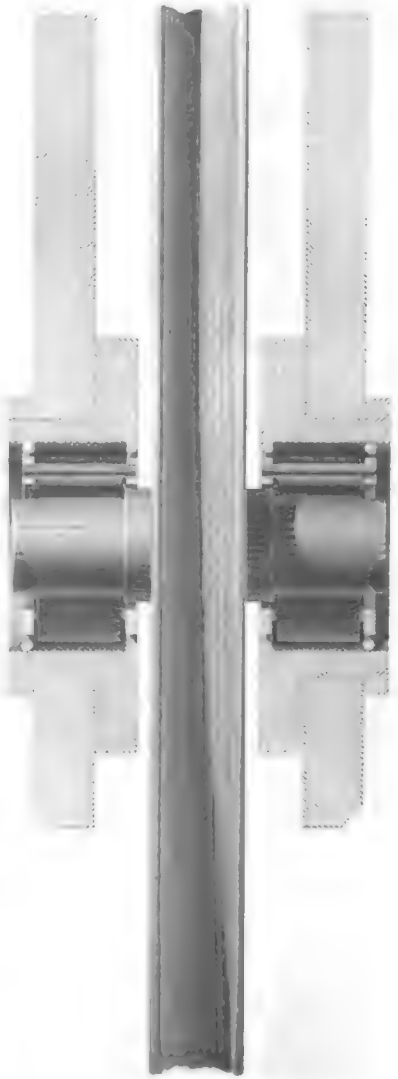


Fig. 3

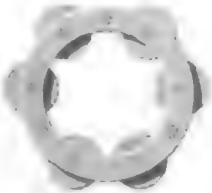
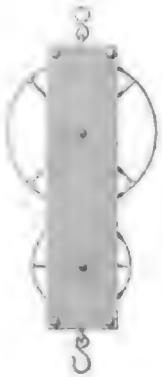


Fig. 4.

Fig. 5.

Fig. 6



Two inch scale

Fig. 7

One inch scale.

Fig. 8.

Digitized by Google

Fig. 2.

Fig. 3.

Fig. 1 A

Fig. 5.

Fig. 6.

Fig. 4

Digitized by Google

INTRODUCTORY OBSERVATIONS

PREFIXED TO THE SECOND VOLUME OF THE MANUSCRIPT

CONTAINING

THE SECOND SERIES OF EXPERIMENTS, VIZ. THOSE MADE IN THE YEARS 1796, 1797, AND 1798:

BEING

THE REPORT DRAWN UP BY COLONEL BEAUFOY, AND PUBLISHED BY THE SOCIETY UNDER THE TITLE OF

THE

REPORT

OF

THE COMMITTEE FOR CONDUCTING THE EXPERIMENTS OF THE SOCIETY

FOR THE IMPROVEMENT OF

NAVAL ARCHITECTURE.

Minus valent præcepta quàm experimenta.—Quinct. i. 5.

The very considerable portion of time which has been unavoidably exhausted in prosecution of the Course of Experiments, the results of which are now submitted to the public; may, it is conceived, have impressed many members of the Society with the idea, that through want of energy, unnecessary delays have been suffered to procrastinate the Report. To remove this impression, it is confidently asserted, that those only who assiduously attended at Greenland Dock during the process, can form any estimate of the labour and time requisite to, and consumed in the Experiments, retarded as they were by the very elaborate calculations which their results progressively required.

It must be added, that though a committee of gentlemen were chosen, all of whom entertained the most ardent desire to render themselves useful in the business, yet, from their professional and other individual concerns, few of them were able to bestow more than their occasional assistance, a considerable portion of which was afforded by one of the Right Honourable Presidents. The *onus* therefore of regular attendance on, and principally conducting the process and calculations, was borne by two gentlemen: nor could they devote the whole of their time to the business, as one of them, an able and experienced officer in the navy, who now commands a large and valuable storeship, was then occasionally employed by government, while the other is vested with a responsible military situation. It is to be hoped, that the attention of the Society and of the public will be directed to the Report of the results of the Experiments, upon which it has been deemed proper to add some observations, that nothing might be wanting to facilitate the further investigation of an object so desirable. To forward the accomplishment of which, it is earnestly requested that the members of this Society will see the necessity of paying up the arrears of their subscription, under a conviction that the conductors of the Experiments have not been idle, and that the expence of apparatus and assistance, engraving, printing, &c. has neither been unnecessary or fruitless, though so heavy, as nearly to have exhausted the finances of the Society.

The Society having directed that Experiments should be made to ascertain the laws respecting bodies moving through the water with different velocities; there have been made in consequence thereof between nine and ten thousand Experiments, in the years 1793, 1794, 1795, 1796, 1797, and 1798.

The Apparatus* which the Society has caused to be erected at Greenland Dock, has been simplified and improved, and has been found by us to answer its purpose extremely well.

The Society will perceive that the Experiments which have been made with it are both curious and instructive. They explain many things which were before either not at all, or but very

* We think it necessary to observe in this place, that a great number of Experiments have been made for the particular purpose of ascertaining the accuracy of the apparatus; by drawing the same bodies through the water by means of the same weights or motive powers, on different and distant days: and it has been found, that the deviations, or differences in the experimented velocities, do seldom exceed one-tenth part of a foot in velocity, when the bodies have been drawn at the rate of ten feet per second: which is a degree of accuracy by far exceeding any Experiments that have hitherto been made known to the public. For a particular description of the said apparatus, see INTRODUCTION, CHAP. XVI. and PLATES I. to V. inclusive.

Digitized by Google

imperfectly understood, and they ascertain new principles; but, what is most valuable, they clearly prove, that experiments can now be made, by means of proper models, so as to ascertain the comparative advantages or disadvantages arising from the form either of the head end, or of the midship body, or of the stern end, of all kinds of navigable vessels.

The following is the Report which we offer to the Society as the result of the Experiments, together with our observations thereon.

CHAP. I.

EXPLANATORY OBSERVATIONS.

HAVING procured two bodies, called the Long Friction Plank and the Short Friction Plank (which were of the same degree of smoothness, and also of the same breadth and thickness, and of the same form in every respect except in length); for the purpose of ascertaining the effect or resistance arising from the friction of the water:—And also other bodies with the same middle part and head end, but with differently formed stern ends; for the purpose of ascertaining the effect of the stern resistance, and the minus pressure; and also other bodies with the same middle part and stern end, but with differently formed head ends; for the purpose of ascertaining the effect of the head resistance and the plus pressure.

All these different bodies were planed smooth, and painted white; and the form and dimensions of the said bodies are respectively represented in TABLE I.

The bodies which are given in TABLE I. (are those tried in 1796, 1797, and 1798,)* were respectively immersed by means of the conductor, and its bar or bars, to the medium depth of six feet under the surface of the water; and when they were so immersed, the conductor swam with its top, or horizontal upper surface, exactly one inch above the surface of the water; but the bodies which were tried in 1793, 1794, and 1795, were only immersed so as to keep the top or horizontal upper surface just even or level with the surface of the water when in motion. All of these bodies were respectively drawn through the water by means of certain weights or motive powers; which motive powers, and also the velocities produced therewith, are respectively shewn in TABLE I. The motive powers† are in the top columns to the right hand, and the velocities produced therewith are in the same columns underneath, and directly opposite to the bodies to which the velocities do respectively belong.

Having obtained a set of velocities by experiment with each of the said bodies, as respectively represented in TABLE I., it then became necessary to examine and compare the said experimented velocities and resistances, in order to search out the laws which belong to the different sets; which examination has been made according to the method specified in the following Chapter.

* The funds of the Society being inadequate to the expence of printing a Report of the whole of the Experiments, it was thought best to confine the Report intended for publication to the results of the three last years of the Experiments, viz. 1796, 1797, and 1798. This Report was called the First Part; and the earlier Experiments, had they been published, would have been called the Second Part of the Report.

† The motive powers or resistances are always specified in pounds avoirdupoise.

CHAP. II.

EXAMINATION OF THE EXPERIMENTED VELOCITIES, TO SEARCH OUT THE LAW OF RESISTANCE WHICH BELONGS TO THE DIFFERENT BODIES.

For this purpose we shall select, by way of example, the set of Experiments with the conductor, its bar, and the Long Friction Plank, as found in Table I. Part I. The numbers run thus:

Motive powers in pounds.....	12	24	36	48	60	72	96	120
Velocities in feet and decimal parts of feet per second.	3.408	4.888	5.847	6.668	7.420	8.161	9.327	10.310

We have selected this set, because it contains a great number of experimented resistances.

Now it is first necessary to try, in what powers of the velocity the several motive powers or resistances are; namely, by comparing together every two experiments: that is, first the 120 lbs. with every weight or resistance less than it; then the 96 lbs. with every weight or resistance less than it; and so on, till every combination of two's has been made.

This examination may be best made in a manner similar to Mr. Garnett's * theorem, viz. as $V^m : v^m :: R : r$; making the resistance proportional to some power of the velocity, which power or exponent m, is found by this rule, viz.

$$m = \frac{\log. R - \log. r}{\log. V - \log. v}$$

* We think it necessary to observe in this place, that in the course of conducting the Experiments since the year 1794, we have constantly used Mr. Garnett's theorem to compare the resistances of the bodies, and have found it to answer exceedingly well. But in order to give it a further investigation, we some time ago submitted a great number of experiments, together with this theorem, to the inspection and consideration of our learned friend and member of this Society, Dr. Hutton, F.R.S. and Professor of Mathematics at the Royal Military Academy at Woolwich, and requested him to favour us with his opinion thereon; when he very obligingly presented us with a written paper on the subject, and which is given in substance in this chapter. We also beg to state that the definitions (vide Chap. I. page xxxix, Introduction), from 1 to 6 inclusive, were drawn up by our ingenious Vice President Earl Stanhope in the year 1795. These, in our opinion, are well conceived and also perfectly consistent with the laws of nature as relative to this subject.

Computed thus:

EXAMPLE I.

Motive powers or resistances $\left\{\begin{array}{l} R = 120 \text{ log.} = 2.07918 \\ r = 96 \text{ log.} = 1.98227 \end{array}\right.$

differ. $= 0.09691$ log. $= \bar{2}.98637$

$V = 10.310$ log. $= 1.01326$

$v = 9.327$ log. $= .96974$

differ. $= 0.04352$ log. $= \bar{2}.63869$

differ. $= 0.34768$ The natural number to this log. is 2.2268, which is the exponent m, or the index of the power of the velocity.

EXPONENTS.

lbs.	lbs.	
120 with	96 =	2.227
	72 =	2.185
	60 =	2.107
	48 =	2.107
	36 =	2.123
	24 =	2.157
	12 =	2.080
96 with	72 =	2.154
	60 =	2.055
	48 =	2.065
	36 =	2.100
	24 =	2.146
	12 =	2.065
72 with	60 =	1.915
	48 =	2.007
	36 =	2.079
	24 =	2.143
	12 =	2.050
60 with	48 =	2.088
	36 =	2.144
	24 =	2.195
	12 =	2.069
48 with	36 =	2.190
	24 =	2.232
	12 =	2.066
36 with	24 =	2.263
	12 =	2.035
24 with	12 =	1.922
Sum =		58.969
Mean = m =		2.1060

Now by applying the aforesaid rule to all the above numbers, the several values of m, or the exponents of the power, come out as shewn in the margin.

These values of m, it is evident, are various, but the variation is small, and vibrates as it were each way; which indicates, that the law of the resistance is constant or regular, and that these irregularities in the values of m, or exponents, proceed from small deviations or irregularities in the Experiments themselves.

It may therefore be adviseable to take a medium amongst them all, and by means of it reduce the experimented numbers into a regular series. Now for this purpose, adding together all these 28 exponents, and dividing the sum by 28 (the number of them) the quotient is 2.1060, which is the mean value of m.

Now the nearest calculated exponent to this value of m is 2.107, found from the numbers 120 and 60, and also from 120 and 48. Assuming therefore either of these terms 120, 60 or 48, and their correspondent velocities, 10.310, or 7.420, or 6.668, and from thence computing the velocities answering to all the other weights or motive powers, the unavoidable irregularities in the Experiments will thus be brought into a regular series. Computing them then in this way, they come out as follows, viz.

Motive powers in pounds	12	24	36	48	60	72	96	120
Velocities in feet and decimal parts	3.455	4.801	5.821	6.673	7.419	8.090	9.273	10.310

All which velocities are computed by this theorem, viz.

$v = V \times \sqrt[m]{\frac{r}{R}}$; or log. v = log. $V - \frac{\text{log. } R - \text{log. } r}{m}$. Wherein $R = 120$, $r = 96$, $m = 2.1060$ and $V = 10.310$.

Computed thus: EXAMPLE II.

$R = 120$ log. $= 2.07918$
$r = 96$ log. $= 1.98227$
0.09691 log. $= \bar{2}.98637$
$m = 2.1060$ log. $= 0.32346$
differ. $\bar{2}.66291$ nat. numb. $= 0.04602$
$V = 10.310$ log. $= 1.01326$
differ. 0.96724. The natural number to this logarithm is $9.2734 = v$, which is the velocity per second correspondent to the motive power or resistance of 96 pounds.

The above series may be considered as the correct or regular series of experiments, with the conductor, its bar, and the Long Friction Plank; and in like manner may be computed the velocities correspondent to other proposed resistances.

And the resistance to proposed velocities are computed by this theorem, viz. $R = r \times \left(\frac{V}{v}\right)^m$; or log. $R =$ log. $r +$ log. $V -$ log. $v \times m$; wherein $r = 120$, $m = 2.1060$, and $v = 10.310$, and $V = 13.5275$, the velocity in feet per second, which answers to 8 nautical miles per hour.

Computed thus: EXAMPLE III.

$V = 13.5275$ log. $= 1.13122$
$v = 10.3100$ log. $= 1.01326$
$0.11796 = \bar{1}.07173$
$m = 2.1060$ log. $= 0.32346$
Sum $= 1.39519$ nat. numb. $= 0.24842$
$r = 120$ log. $= 2.07918$
Sum 2.32760 The natural number to this logarithm $= 212.618 = R$, which is the resistance of the conductor, its bar, and the Long Friction Plank, for the velocity of 8 nautical miles per hour. And in like manner may be computed the resistance correspondent to any proposed velocity.

So that the regular series of velocities as given in the right hand columns of TABLE I. have been computed according to EXAMPLE II.; and the resistances correspondent to the velocities of from 1 to 8 nautical miles per hour, as given in the left hand columns of TABLE I. have been computed by EXAMPLE III.

Velocity in Feet per second.		Nautical Miles per hour.
1.6909		1
3.3819		2
5.0728		3
6.7638		4
8.4548	is equal to	5
10.1456		6
11.8366		7
13.5275		8

Digitized by Google

CHAP. III.

ON THE FINDING OF THE FRICTION.

HAVING (by the method specified in EXAMPLE II. of the preceding Chapter) found the motive powers requisite to bring the different bodies to exactly the same rates of velocity, viz. from 1 to 8 nautical miles per hour, and as found in TABLE I. Then the next object which is necessary to be obtained, is to ascertain the resistance arising from the friction of the water against the several surfaces of the different bodies respectively.

Now, for this purpose, it will be seen by inspecting the form and dimensions of the friction planks, as used in the Experiments of 1798 (p. 487 and 499), that the Long Friction Plank was exactly 12 feet longer than the Short Friction Plank; and that they were of the same degree of smoothness; also, that they were exactly similar in the form and dimensions of their head ends and stern ends; or that they were similar in every respect except in length. From whence it is evident, that whatever difference arises between the resistance of the two planks, such difference must be the resistance arising from the friction alone of the water against 46 square feet of surface, which is the surface contained in the Long Friction Plank more than in the Short Friction Plank.

Therefore, the difference between the resistances of the two friction planks, (which is equal to the friction of the water against 46 square feet of surface, as aforesaid), is accordingly found in TABLE II.; and from thence the motive powers requisite to overcome the resistance arising from the friction of the water, which takes place against the several surfaces of the different bodies, have been computed according to the proportion which the said surfaces respectively bear to 46 square feet, and as found in TABLE II.

CHAP. IV.

ON THE RESISTANCE SUSTAINED BY THE DIFFERENT BODIES WHEN CONSIDERED AS SHIPS OR NAVIGABLE VESSELS; WITH COMPARATIVE OBSERVATIONS RELATIVE TO THE ADVANTAGES OR DISADVANTAGES ARISING FROM THE FORM, WITH RESPECT TO THE RELATION WHICH THE RESISTANCE BEARS TO THE CAPACITY, AND TO THE STABILITY OR POWER OF CARRYING SAIL, AND ALSO TO THE VIS INSITA FORCE.*

It has been already shewn, that the bodies used in the years 1796 and 1798 were respectively immersed to the medium depth of six feet under the surface of the water; then in order to make comparisons with the said bodies, considering them as ships or navigable vessels, it is first necessary to deduct the friction which takes places against the top surface of the said bodies as found in TABLE II., from the total resistance as found in TABLE I., then the remaining numbers will represent the resistance sustained by the different bodies, when considered as the immersed part of ships or navigable vessels.

The said deductions are accordingly made in TABLE III.; and the motive powers requisite to overcome the resistance of the different bodies, when considered as ships or navigable vessels, is therein found.

In the Experiments of the year 1798, the bodies **Ao**, **Aa**, &c. to **Ai**, were constructed for the purpose of ascertaining the advantages or disadvantages arising from their several differently formed stern ends. Now by inspecting the resistances of the bodies **Ao** and **Aa** (as ships), and found in TABLE III., it will be seen, that the resistance of the body **Aa** is a little less than the resistance of the body **Ao**; and also, that the resistance of the body **Ha** is a little less than the resistance of the body **Ho**; which curious circumstance arises in each case from the stern end **o** having a greater surface for friction than the stern end **a**.

From whence it is evident, that the resistance arising from the friction against the stern end **o** is greater than the friction and minus pressure together of the stern end **a**.

* *Vis insita*, or innate force of matter, is a power of resisting, by which every body, as much as in it lies, endeavours to persevere in its present state, whether of rest or of moving uniformly forward in a right line.—This force is always proportional to the quantity of matter in the body, and differs in nothing from the *vis inertiæ*, but in our manner of conceiving it.—See HUTTON'S *Mathematical Dictionary*, Art. Vis Insita, &c.

It will also be seen by inspecting TABLE III., that the resistance of the body **Ab** (as a ship), is a little less in the velocities from five miles per hour downwards, than the resistance of **Aa**; but in the higher velocities the body **Aa** has the least resistance.

This crossing is occasioned by the law of the stern resistance of the stern end **b**, increasing in a greater ratio than the stern resistance of the stern end **a**; and which probably arises from the angular part of the stern end **b** (that is from s to b,) being more obtuse than that of the stern end **a**.

And with respect to the bodies **Ac**, **Ad**, &c. to **Ai**, it will be seen, that they have all greater resistances than either of the aforesaid bodies **Ao**, **Aa**, or **Ab**: which are disadvantages that evidently arise out of the form of the stern end of the said different bodies respectively; and of which the stern end **f** of the body **Af**, has the greatest disadvantage, or is the worst stern end of all.

The bodies **Aa**, **Ba**, **Ca**, &c. to **Ia**, were constructed for the purpose of ascertaining the advantages or disadvantages arising from their several differently formed head ends.

Now by inspecting the resistance of the said bodies, as ships, as found in TABLE III., the comparative advantages or disadvantages, arising from their several differently formed head ends, will readily be seen: that is so far as concerns the resistances only.

But in the investigation of this subject, that is considering the said bodies as representing ships, it must be noticed, that the said different bodies have different magnitudes, and consequently different degrees of stability, or stiffness to carry sail; and also the relation which the resistance bears to the capacity, or the relation which the resistance bears to the *vis insita* force, or power of going forward, and the momentum will be different in each body.

Then taking the subject in this point of view, it of course becomes necessary to ascertain the relation which the resistance bears to the capacity, and also the comparative degrees of stability of the different bodies respectively: and from thence we shall be enabled to draw proper conclusions respecting the said bodies, as applicable to practice.

And as the said bodies are of the same form and dimensions in their midship section, and only differ in length, and in the form of their head ends and stern ends; therefore their comparative stability will be nearly in proportion to the capacities of the different bodies respectively.

From whence it is readily conceived, that the comparative power, or quantity of sail, which the different bodies are capable of sustaining, will also be nearly in proportion to the capacities of the different bodies respectively.

And the capacities of the different bodies, when considered as ships, or as a column of water, are found to be as follows:—

Weight of the following Bodies as a column of Water.		lbs.	lbs.	lbs.
	Ao ..... =	294.37	Ad or Da = 215.63	Ah or Ha = 179.37
	Aa ..... =	247.50	Ae or Ea = 199.37	Ai or Ia = 155.00
	Ab or Ba =	266.25	Af or Fa = 181.87	Ho..... = 226.25
	Ac or Ca =	300.00	Ag or Ga = 193.13	Io..... = 201.87

Then by taking the resistances of the said bodies, say at the velocity of five miles per hour, as found in TABLE III., and placing them as numerators; and also by placing the capacities or weights of the said bodies, as found above, under their correspondent resistances, as denominators; then the numbers so placed will represent the relation which the resistance bears to the capacity; and also the relation which the resistance bears to the stability; as also the relation which the resistance bears to the *vis insita* force, or power of going forward (or to the momentum) all which relations are as follows:—

	lbs.	lbs.	lbs.
Ao .. Resistance =	16.45	Da .. Resistance = 17.61	Ha .. Resistance = 18.77
Capacity =	294.37	Capacity = 215.63	Capacity = 179.37
Aa .. Resistance =	16.31	Ea .. Resistance = 19.91	Ia .. Resistance = 61.47
Capacity =	247.50	Capacity = 199.37	Capacity = 155.00
Ba .. Resistance =	15.23	Fa .. Resistance = 23.49	Ho .. Resistance = 19.02
Capacity =	266.25	Capacity = 181.87	Capacity = 226.25
Ca .. Resistance =	17.12	Ga .. Resistance = 16.23	Io .. Resistance = 61.35
Capacity =	300.00	Capacity = 193.13	Capacity = 201.87

For the sake of comparing the above numbers more readily, they have been considered as fractions, and reduced to their lowest terms, from whence the relation which the resistance bears to the capacity, or the capacity to the resistance, &c. &c. will be as follows:—

	Ao	Aa	Ba	Ca	Da	Ea	Fa	Ga	Ha	Ia	Ho	Io
Resistance	1	1	1	1	1	1	1	1	1	1	1	1
Capacity	17.895	15.175	17.482	17.523	12.244	10.014	7.743	11.899	9.556	2.522	11.895	3.291

Now, by inspecting the above numbers, it appears, that the relation which the resistance bears to the capacity (or to the stability, or to the *vis insita* force) is nearly the same in the bodies **Ao**, **Ba**, and **Ca**; that is to say, if their respective resistances be equal to 1, then the capacity or stability, or *vis insita* force of **Ao**, is 17.895, of **Ba**, 17.482, and of **Ca**, 17.523: from whence it appears, that the body **Ao** has the greatest advantage, and the body **Ca** the next greatest advantage. But supposing the said bodies to be ships in motion at sea; then it may fairly be inferred, that the body **Ca** would be the worst of the three bodies; because the head end of the body **Ca** would not meet with so much lateral resistance to keep the body to windward; and it would meet with more resistance in its pitching motion than either of the bodies **Ao** or **Ba**.

We have thought it adviseable to say thus much respecting the method of comparing the results of the Experiments with the said bodies, in order to prevent persons who might not have had an opportunity of considering the subject fully, from drawing their conclusions by comparing the resistances only; and for which reason it might be proper to make further comparisons by way of illustration. Now, for this purpose, we shall compare the resistance of the bodies **Ca** and **Ga**, as found in TABLE III.; from whence it appears, that the said resistances are nearly the same: but on considering the said bodies as ships at sea, and impelled forwards by the force of the wind in their sails; and by inspecting the above numbers it is found, that if the resistance of the bodies **Ca** and **Ga**, be respectively equal to 1, that then the capacity and stability, or comparative power to carry sail, as also the *vis insita* force of the long body **Ca**, would be 17.523, and of the short body **Ga**, 11.899.

From whence it is evident, that the long body **Ca** has not only the advantage of being capable of bearing about one-third more sail, than the short body **Ga**; but it also has an advantage arising from its great *vis insita* force, or the power of overcoming such resistance as may be occasioned by the undulation of the water (or otherwise) to its direct motion.

And further it is to be considered, that the pitching motion is not so quick, nor the arcs of vibration in general so great in long* ships as in short ships; therefore the short ship has not only a disadvantage (as compared with a long ship) arising from the smallness of its *vis insita* force; but also the disadvantage of such *vis insita* force being destroyed in a much greater degree by the pitching motion, than the *vis insita* force of the long ship possibly can by its pitching motion.

Again, it is also necessary to consider, that the power of the wind, by which ships obtain their velocity, is variable in its force and direction in almost every instant of time: consequently the long ship, which has the greatest *vis insita* force, will have the advantage, as compared with the short ship, of moving with more uniformity in its velocity, and more steadiness in its direct motion; and will of course thereby feel the power of the wind upon its sails in a greater comparative degree than the short ship can upon its sails.

In the Experiments of the year 1796 it will be seen by inspecting TABLE I. that the bodies **APa**, **EPa**, **KPa**, and **LPa**, were respectively constructed with differently formed head ends, but with the same middle part and stern end.

Then, for the sake of comparison, we shall place the resistance of the said bodies as ships moving with the velocity of five miles per hour (and as found in TABLE III.) as numera-

* This comparison alludes to ships of the same form and dimensions in the head end and stern end, and having the same form in the midship section; but of different lengths by means of midship body; or to the advantages and disadvantages in ships that have been lengthened, as compared before and after they are lengthened in the midship body.

tors; and the capacities or weights of the said bodies, under their correspondent resistances as denominators; and as follows:

APa { Resistance = 23.48 lbs. / Capacity = 810.01	EPa { Resistance = 28.26 lbs. / Capacity = 761.87	KPa { Resistance = 27.50 lbs. / Capacity = 805.62	LPa { Resistance = 26.79 lbs. / Capacity = 833.12

By reducing the above numbers to their lowest terms, the relation which the resistance bears to the capacity, or the capacity to the resistance, will be as follows:

APa	EPa	KPa	LPa
1	1	1	1
34.498	26.959	29.295	31.098

Now the body APa is exactly of the same form and dimensions in its head end and stern end, and in every respect, except in the length of its middle part, as the body Aa in the Experiments of 1798. But by comparing the relation which the resistance bears to the capacity, &c. of the body Aa, as already found in this Chapter, with the relation which the resistance bears to the capacity, &c. of the body APa, as found above, it appears, that if the resistance of the said bodies Aa and APa be respectively equal to 1, that then the capacity and comparative stability, and *vis insita* force, of the short body Aa, would be 15.175; and of the long body APa, 34.498. From whence a very considerable advantage appears in favour of the long body APa, and which arises from the length of the midship body only. *

The isosceles angular head end E of the body EPa, and the projecting angular head end K of the body KPa, were constructed so as to have the same angle of inclination, and the same area of oblique surface in their respective head ends: that is to say, that the hypotheneuse, or oblique surface of the head end K, is equal to the sum of the two sides, or oblique surface of the head end E.

The oblique surface of the head end K was made to incline upwards, for the purpose of ascertaining the advantage or disadvantage which might arise from its resistance in such position, as compared with the resistance of the head end E, according to its position.

Now by comparing the relation which the resistance bears to the capacity, &c. of the said bodies, as already given in this Chapter, it appears, that if the resistance of the bodies EPa, and KPa, be respectively equal to 1, then the capacity, or stability, or *vis insita* force, of EPa,

* In like manner, comparisons may be made with the other bodies; and it is a method of reasoning which applies to all kinds of vessels moved by sails. But in applying the said method of reasoning to ships or models of differently formed midship sections, and of different breadths and depths, it is of course then necessary to ascertain the stability of each body, according to its particular form, and the height of its center of gravity, &c. &c.

is 26.959, and of KPa, 29.295, which shews an advantage in favour of the body KPa* that is of some moment, and which advantage arises from the form of its head end only.

The compound projecting angular head end L, of the body LPa, was constructed with the same angle of inclination upwards, in the direction of yr (see TABLE I. Experiments 1796), as the head end K, of the body KPa, and the horizontal section of its pointed end is an equilateral triangle; this head end was constructed for the purpose of ascertaining the advantage or disadvantage which might arise from such form as compared with the head end K of the body KPa.

Now, by comparing the relation which the resistance bears to the capacity, &c. of the said bodies, as already given in this Chapter, it appears, that if the resistance of the bodies KPa, and LPa, be respectively equal to 1, then the capacity, or stability, or *vis insita* force of the body KPa, is 29.295; and of the body LPa, 31.098, which gives an advantage in favour of the body LPa, and which advantage arises from the form of its head end only.

* This advantage is supposed to arise from the particles of water which strike the oblique surface of the said head end K, being deflected downwards under the body, by which means the head end is impelled upwards.

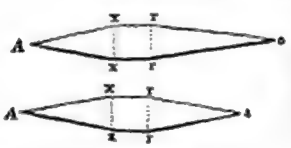
Digitized by Google

CHAP. V.

ON THE FINDING THE PLUS AND MINUS PRESSURES (TOGETHER AND SEPARATELY) OF THE DIFFERENT BODIES RESPECTIVELY, WITH COMPARATIVE OBSERVATIONS RESPECTING THE LAW OF THE PLUS PRESSURE AGAINST DIRECT AND OBLIQUE SURFACES.

THE motive powers requisite to overcome the plus and minus pressures (together) of the different bodies respectively, may be found in two ways: that is, either by deducting the friction of the water which takes place against the total surface of the different bodies as found in TABLE II. from the total resistance of the said bodies, as found in TABLE I., then the remaining numbers will be equal to the motive powers requisite to overcome the plus and minus pressures (together) of the different bodies respectively. Or by deducting the friction against the sides and bottom surface of the different bodies, as found in TABLE II. from the resistance of the said bodies as ships, and as found in TABLE III., then the remaining numbers will also be equal to the motive powers requisite to overcome the plus and minus pressures (together) of the different bodies respectively. Of which two methods, we have used the latter one, and the plus and minus pressures (together) of the different bodies respectively is thereby found in TABLE III.

Then, in order to separate the said plus and minus pressures, we shall first compare the resistance of the bodies Ao and Aa, as found in the left hand column of TABLE I. which are as follows:

	Page.	NAUTICAL MILES per HOUR.							
		1	2	3	4	5	6	7	8
Horizontal Section.		MOTIVE POWERS in POUNDS and parts of POUNDS.							
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Head Ends 	509	0.73	2.94	6.52	11.38	17.43	24.62	32.85	42.07
	514	0.71	2.87	6.38	11.17	17.14	24.26	32.42	41.59

Now by inspecting the form and dimensions of the said bodies, as found in TABLE I., or the top view as shewn above, it will be seen, that the head end and middle part of the said bodies are the same, and that the said bodies only differ in the form and dimension of their stern ends.

Digitized by Google

Consequently, whatever difference arises between the resistances of the said bodies, as found above, must be occasioned by the form and dimensions of the stern ends only. Then by inspecting the above numbers, it appears, that the body Ao meets with a little more resistance than the body Aa; which evidently shews, that the stern resistance of the body Ao is a little more than the stern resistance of the body Aa.

And further, by comparing the total resistance of the body Ho, with the total resistance of the body Ha, as respectively found in the left hand column of TABLE I., they are as follows:

Horizontal Section.	Page.	NAUTICAL MILES per HOUR. 1	2	3	4	5	6	7	8
		MOTIVE POWERS in POUNDS and decimal parts of POUNDS.							
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Head Ends H o	610	0.78	3.20	7.21	12.76	19.78	28.25	38.10	49.28
Head Ends H a	603	0.76	3.13	7.06	12.49	19.37	27.67	37.31	48.26

Now in this comparison, the same result as the former is proved; namely, that the stern resistance of the body Ho is a little more than the stern resistance of the body Ha.*

But when the friction against the several surfaces of the bodies Ao, and Aa, is deducted (which is done in TABLE III.), then by comparing the plus and minus pressures (together) of the said body Ao with the plus and minus pressure together of the said body Aa, as found in TABLE III., they are as follows:

Nautical miles per hour	1	2	3	4	5	6	7	8
Plus & minus press. (together) of Ao, as per TABLE III.	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
Plus & minus press. (together) of Aa, as per TABLE III.	0.44	1.92	4.46	8.01	12.56	18.14	24.66	32.13

Now according to the above numbers, it appears, that the plus and minus pressures together, of the body Ao, is a little less than the plus and minus pressures together of the body Aa.

But, as the plus pressure against the head end A must be the same in both bodies, and as the friction is wholly taken away, therefore the difference between the said numbers must be the dif-

* This is a curious fact, and very interesting to the constructors of ships.

ference of the minus pressure only; which difference being very small, when compared with the great difference in the length of the stern ends o, and a, thence it may fairly be inferred, that the stern end o has no minus pressure; or, if any, that it is so small as to be of no moment in the present investigation of the subject.

Then taking the minus pressure of the stern end o, of the body Ao, to be equal to 0.000lbs. at any velocity from 1, to 8, nautical miles per hour; from thence the plus pressures and minus pressures, to all the bodies, is separately found as in TABLE III.

COMPARATIVE OBSERVATIONS RESPECTING THE LAW OF THE PLUS PRESSURE AGAINST DIRECT AND OBLIQUE SURFACES.

Now, if we take the plus pressure of the flat head end I, of the body Io, at the velocity of eight miles per hour, as found in TABLE III., and which is equal to 148.25 lbs. and reduce it according to the sines of the angles of incidence of the different angular head ends A, D, E, F; such plus pressures will come out as in this Table:

Angle of Incidence.	Plus Pressure by experiment.	Plus Pressure by Theory Sine of Angle of Incidence to radius 148.25 lbs.
	lbs.	lbs.
A = 9 44 10*	= 30.67	24.71
D = 14 28 40	= 35.34	37.06
E = 19 28 15	= 41.71	49.42
F = 30 00 00	= 51.44	74.13

And by comparing the said plus pressures with the plus pressure, as deduced from experiment with the said bodies, as found in TABLE III., and as also found in this TABLE; from thence it is evident, that the plus pressures, as deduced from experiment, do not follow the law of the Sine of the Angle of Incidence, nor any regular law that we have yet discovered.

* In page 509, it is called 9° 35′ 38″.

CHAP. VI.

TABLES OF THE LAW, OR INDEXES OF THE POWER OF THE VELOCITY, BY WHICH THE TOTAL RESISTANCE—THE FRICTION—THE PLUS PRESSURE—AND THE MINUS PRESSURE OF THE DIFFERENT BODIES RESPECTIVELY INCREASE, OR DECREASE, WITH OBSERVATIONS THEREON.

TABLE I.

INDEXES of the power of the velocity, by which the total resistance of the different bodies increase or decrease.

Nautical miles per hour			2	3	4	5	6	7	8
This Table is formed by comparing the resistance of the different bodies at the velocity of 1 mile per hour (as found in the second or under line of figures that are opposite to each body in the left hand columns of TABLE I. of the Experiments) with the resistance at each of the following velocities up to 8 miles per hour; and by the method specified in CHAPTER II. EXAMPLE I.			INDEXES of the Power of the Velocity.						
	Bodies used in the Experiments of the year 1798.	Ao ...	2.010	1.993	1.981	1.971	1.964	1.956	1.950
		Aa ...	2.015	1.999	1.988	1.978	1.971	1.964	1.958
		Ab ...	2.042	2.030	2.020	2.013	2.007	2.001	1.996
		Ac ...	2.000	1.983	1.971	1.962	1.954	1.946	1.940
		Ad ...	1.987	1.973	1.961	1.951	1.942	1.934	1.927
		Ae ...	2.034	2.019	2.011	2.003	1.998	1.992	1.987
		Af ...	2.053	2.045	2.041	2.036	2.033	2.030	2.027
		Ag ...	1.965	1.950	1.938	1.928	1.919	1.911	1.904
		Ah ...	2.020	2.006	1.996	1.988	1.982	1.976	1.971
		Ai ...	2.027	2.014	2.006	2.000	1.995	1.990	1.985
		Ba ...	2.040	2.030	2.021	2.014	2.009	2.004	1.999
		Ca ...	2.005	1.991	1.980	1.971	1.963	1.956	1.950
		Da ...	2.014	2.001	1.993	1.986	1.980	1.974	1.969
		Ea ...	2.026	2.012	2.003	1.995	1.989	1.983	1.977
		Fa ...	2.019	2.010	2.002	1.996	1.991	1.986	1.981
		Ga ...	2.038	2.027	2.020	2.014	2.008	2.004	1.999
		Ha ...	2.042	2.029	2.019	2.012	2.006	2.001	1.996
		Ho ...	2.037	2.024	2.016	2.009	2.003	1.998	1.994
		Ia ...	2.018	2.011	2.006	2.002	1.999	1.996	1.994
		Io ...	2.012	2.006	2.002	1.998	1.995	1.992	1.989
	Bodies used in the Experiments of the year 1796.	APa ..	1.822	1.818	1.817	1.816	1.816	1.815	1.815
		EPa ..	1.839	1.833	1.831	1.831	1.830	1.829	1.829
		KPa ..	1.853	1.849	1.849	1.848	1.848	1.848	1.847
		LPa ..	1.847	1.842	1.841	1.840	1.839	1.838	1.838
		IPa ..	1.954	1.952	1.952	1.951	1.951	1.951	1.951
		APc ..	1.833	1.832	1.831	1.831	1.831	1.830	1.830
		APk ..	1.861	1.856	1.855	1.854	1.854	1.853	1.853
		APl ..	1.818	1.817	1.817	1.816	1.816	1.815	1.815
		APi ..	1.873	1.869	1.868	1.868	1.867	1.867	1.867

OBSERVATIONS.

By inspecting the numbers in this TABLE I. it appears, that the power of the velocity of the bodies used in the Experiments of the year 1798, at two miles per hour, is in general a little above the duplicate ratio, or square of the velocity; but that the ratio gradually decreases as

the velocity increases, and becomes a little less than the duplicate ratio at the velocity of eight miles per hour (except with the body A f, which is always greater than the duplicate ratio).

And with respect to the bodies used in the year 1796, it also appears by inspecting the numbers in this TABLE I., that the power of the velocity with the said bodies is considerably less than that of the bodies used in 1798, and is always less than the duplicate ratio. This difference in the power of the velocity of 1798 and 1796, arises from the bodies used in 1796 having a much greater surface for friction than the bodies used in 1798; and also, because the said friction always increases in a much less ratio than the duplicate ratio (see TABLE II. of this Chapter below). So that the friction of the bodies used in 1796 forms a greater proportional part of their total resistance, than it does in the bodies used in 1798.

TABLE II.

INDEXES of the power of the velocity by which the resistance arising from the friction of the water increases or decreases.

Nautical miles per hour		2	3	4	5	6	7	8
This Table is formed by comparing the friction on 46 square feet of surface, as found by the Experiments of 1798; and also by comparing the friction on 50 square feet of surface, as found by the Experiments of 1796, according to the method specified for TABLE I. in this CHAPTER.		INDEXES of the Power of the Velocity.						
	From the friction as found by the Experiments of the year 1798.	1.823	1.800	1.780	1.762	1.745	1.729	1.713
	From the friction as found by the Experiments of the year 1796.	1.753	1.741	1.734	1.729	1.726	1.723	1.720

TABLE III.

INDEXES of the power of the velocity by which the plus pressures of the different bodies increase or decrease.

Nautical miles per hour		2	3	4	5	6	7	8
This Table is formed by comparing the plus pressures of the different bodies (as found in TABLE III.) according to the method specified as for TABLE I. in this CHAPTER.		INDEXES of the Power of the Velocity.						
	Head Ends of the Bodies used in the year 1798. A	2.162	2.138	2.121	2.109	2.101	2.093	2.087
	B	2.219	2.201	2.192	2.184	2.179	2.173	2.168
	C	2.136	2.119	2.106	2.096	2.088	2.080	2.074
	D	2.116	2.098	2.092	2.086	2.078	2.072	2.067
	E	2.108	2.090	2.081	2.073	2.067	2.061	2.056
	F	2.091	2.078	2.069	2.062	2.056	2.051	2.046
	G	2.162	2.140	2.132	2.125	2.118	2.113	2.109
	H	2.142	2.120	2.107	2.099	2.092	2.087	2.082
	I	2.036	2.029	2.024	2.020	2.017	2.014	2.012
	Head Ends of the Bodies used in the year 1796. A	2.162	2.138	2.121	2.109	2.101	2.093	2.087
	E	2.068	2.050	2.038	2.029	2.023	2.019	2.014
	K	2.155	2.132	2.118	2.106	2.098	2.092	2.086
	L	2.158	2.135	2.119	2.105	2.096	2.090	2.084
	I	2.068	2.059	2.053	2.048	2.045	2.043	2.041

OBSERVATION.

By inspecting the numbers in this TABLE III. it appears, that the power of the velocity of the plus pressure is always a little above the duplicate ratio.

TABLE IV.

INDEXES of the power of the velocity by which the minus pressure of the different bodies increase or decrease.

Nautical miles per hour		2	3	4	5	6	7	8
		INDEXES of the Power of the Velocity.						
This Table is formed by comparing the minus pressures of the different bodies (as found in TABLE III. of Analysis) according to the method specified, as for TABLE I. in this CHAPTER.	Stern Ends of the Bodies used in the year 1798. a ...	1.701	1.738	1.730	1.723	1.731	1.730	1.730
	b ...	.....	.....	5.416	4.823	4.426	4.205	4.053
	c ...	1.837	1.834	1.834	1.830	1.820	1.813	1.806
	d ...	1.751	1.744	1.740	1.729	1.714	1.698	1.682
	e ...	1.968	1.964	1.976	1.980	1.982	1.982	1.982
	f ...	2.060	2.061	2.065	2.066	2.066	2.066	2.066
	g ...	1.860	1.841	1.828	1.818	1.806	1.795	1.785
	h ...	1.953	1.939	1.936	1.933	1.930	1.927	1.924
	i ...	1.978	1.969	1.969	1.967	1.965	1.963	1.961

OBSERVATION.

By inspecting the numbers in this TABLE IV. it appears, that the power of the velocity of the minus pressure is various, and is always less than the duplicate ratio, except with the stern ends b and f, which is always greater than the duplicate ratio. Now, as the minus pressure of the stern end b is very little (only 0.04 lbs.) at the velocity of three miles per hour, and 2.13 lbs. at eight miles per hour (see the body Ab in TABLE III. PART 1. of Analysis); therefore the great comparative ratio by which the said minus pressure increases, might partly arise from the form of the stern end, and partly from a small error in the Experiments with the said body at the slow velocities; for an error of $\frac{1}{11}$ part of a pound in the resistance, at the velocity of one mile per hour, would produce the effect in the law of the minus pressure as shewn in this TABLE.

CHAP. VII.

COMPARATIVE OBSERVATIONS RESPECTING THE RESISTANCE OF THE ISOSCELES TRIANGLE —THE CUBE—THE SQUARE PLANE—THE ROUND PLANE—THE CYLINDER—THE GLOBE, &c. AS USED IN THE EXPERIMENTS OF THE YEAR 1797, WHEREIN THE EFFECT OF THE DEFLECTION OF THE WATER ON THE MINUS PRESSURE IS EXEMPLIFIED, WITH COMPARISONS RELATIVE TO THE ACCURACY OF THE EXPERIMENTS.

THE isosceles triangle M, in the Experiments of the year 1797, is exactly of the same form and dimensions as the angular head end A of the body Ai, &c. in the Experiments of the year 1798 (see TABLE I., PART II. and III.). From whence the plus pressure of the said triangle M is conceived to be the same as the plus pressure of the said head end A, and the minus pressure of M is conceived to be nearly the same as the minus pressure of the stern end i; and the friction on M being given in TABLE II.—then, for the sake of comparison, we shall compare the sum of these resistances with the total resistance of the triangle M, as found by actual experiment in TABLE I. PART III. as follows:

Nautical miles per hour.....	1	2	3	4	5	6	7	8
	MOTIVE POWERS in POUNDS and decimal parts.							
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Plus Pressure of A, TABLE III. PART II. Exp. 1798..	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
Minus Pressure of i, TABLE III. PART II. Exp. 1798.	0.49	1.93	4.26	7.51	11.62	16.57	22.35	28.92
Friction on M, TABLE II. Experiments 1798.....	0.11	0.39	0.79	1.29	1.87	2.50	3.17	3.87
This sum for the total resistance of triangle M.....	1.00	4.11	9.24	16.37	25.41	36.32	49.02	63.46
The total resistance of triangle M by actual experiment, as found in TABLE I. PART III.....	1.12	4.39	9.70	16.96	26.13	37.15	49.99	64.61

By inspecting these numbers, it appears, that the total resistance of the triangle M, as found by actual Experiment in 1797, is a little more than the total resistance as deduced from the Experiments of 1798.

This small* difference is conceived to arise from the effect which the deflection of the water has on the minus pressure of the triangle M; for the water which is deflected by the oblique surface or sides of the said triangle M, acts with its deflected force, to prevent the surrounding water from filling up the void at the base or stern end of the triangle.

* It is necessary to observe, that the effect which the deflection has on the minus pressure of the triangle M, cannot be much, because its angular form is very acute.

Whereas in the body Ai, the water which is deflected by its oblique surface has time to lose the effect of deflection, and becomes parallel to the sides of the moving body before it arrives at its stern end; therefore the surrounding water is not impeded by deflection, from acting with its full force and pressure to fill up the void behind.

The cube R, the square iron plane S, the round iron plane T, and the cylinder U, were constructed with the same area of flat surface in the head end and stern end; namely, 1 square foot of surface in each, for the purpose of ascertaining the advantages or disadvantages, arising from such form, with respect to the effect of the deflection of the water.

By inspecting the resistances of the said bodies, as found in TABLE I. PART III., it appears that the cube R has less resistance than the square plane S; and that the cylinder U has less resistance than the round plane T: these differences evidently arise from the water which is deflected by the front of the square plane S (and the same with respect to the round plane T) acting with its whole deflected force, to prevent the surrounding water from filling up the void behind.

Whereas, in the cube R,* and cylinder U, the water which is deflected by the front of the said bodies, has time to lose a great part of its deflected force before it arrives at the stern end of the moving bodies, and therefore the surrounding water is but little impeded by deflection from filling up the void behind the said bodies R, and U, respectively.

The experiments with the cylinder, with a semi-globe for the stern end, called W, and the cylinder with a semi-globe for head end, called X, serves to show the advantages or disadvantages arising from such forms, and which may readily be seen, by inspecting the resistances of the said bodies as found in TABLE I. PART III.

The cylinder with the semi-globe for head end, and stern end called Y, and the globe Z, were constructed for the particular purpose of ascertaining the advantages or disadvantages arising from such forms, with respect to the effect of the deflection of the water.

Now, by inspecting the resistance of the said bodies, as found in TABLE I. PART III. we find, that the resistance of the cylinder with a semi-globe on each end, or body Y, when moving at the velocity of 8 miles per hour, is 46.29 lbs., and that the resistance of the globe Z at the same velocity is 64.87 lbs.; from whence it appears, that there is a considerable advantage in favour of the body Y. This advantage evidently arises, from the minus pressure of the body Y, being very little, if at all affected by the deflection of the water from its head end; because the water which

* We apprehend that the difference which appears between the resistance of the cube R, and the cylinder U, arose from our not being able to draw the cube through the water with the same degree of steadiness as the cylinder; and it may be proper to observe, that we found great difficulty in drawing these short bodies, with flat head ends and flat stern ends, through the water with the same degree of steadiness as the other bodies, but the cube was the worst of all.

is deflected by the circular surface of its head end, has sufficient time to lose the effect of deflection, and becomes parallel to the sides of the moving body, before it arrived at the stern end, and therefore the surrounding water is not impeded by deflection from acting with its full force, and pressure (or nearly so) to fill up the void behind.

Whereas in the globe **Z**, the water which is deflected by the circular surface of its head end, acts with great force to prevent the surrounding water from filling up the void behind.

So that the comparative effect, arising from deflection alone upon the minus pressure of the globe **Z**, appears to be 18.58 lbs. more than upon the body **Y**; which is very considerable.

COMPARISONS RELATIVE TO THE ACCURACY OF THE EXPERIMENTS.

The parallelopipedon, or body **IPi**, in the Experiments of the year 1796, was constructed for the purpose of making comparisons or for verification, with respect to the accuracy of the Experiments, as shewn in the following Example:

Nautical miles per hour.....	1	2	3	4	5	6	7	8
	Motive Powers in Pounds and decimal parts of Pounds.							
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Plus press. I, of the body IPa, Table III. Plate III.	2.14	8.97	20.54	36.83	57.81	83.51	113.94	148.98
Minus press. i, of the body APi, Table III. Part III.	0.69	2.42	5.04	8.56	12.96	18.16	24.24	31.15
Friction on total surface of IPi, Table II.....	0.56	1.89	3.79	6.20	9.05	12.35	16.01	20.03
Sum for the total resistance of body IPi.....	3.39	13.28	29.37	51.59	79.82	114.02	154.19	200.16
Total resistance of body IPi, per actual experiment, Table I. Part IV.	3.39	13.19	29.14	51.16	79.16	113.08	152.86	198.47

By inspecting the above numbers, it appears, that the resistance of the body **IPi**, as deduced from the Experiments, with the bodies **IPa** and **APi**, comes out nearly the same as the resistance found by actual Experiment with the said body **IPi**; and that the difference or deviation does not amount to $\frac{1}{150}$ part of the resistance: which is a strong proof of the accuracy of the Experiments with the said bodies **IPa**, **APi**, and **IPi**, and which is further proved by comparing the plus pressure of the flat head end **I**, as found by the Experiments of 1798 (Table III. Part II.), with the plus pressure of the flat head end **I**, as found by the Experiments of 1796 (Table III. Part III.), as below:

Nautical miles per hour.....	1	2	3	4	5	6	7	8
	Motive Powers in Pounds and decimal parts.							
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Plus pressure of I, as per body Ia, Experiments 1798.	2.27	9.31	21.08	37.55	58.64	84.27	114.38	148.92
Plus pressure of I, as per body IPa, Experiments 1796.	2.14	8.97	20.54	36.83	57.81	83.51	113.94	148.98

CHAP. VIII.

COMPARATIVE OBSERVATIONS RESPECTING THE RESISTANCE ARISING FROM THE FRICTION OF THE WATER.

It may be necessary to observe, for the sake of explaining the different effects which have been found with respect to friction, that the respective Friction Planks and other bodies that were used in the Experiments of the year 1796, were planed smooth and painted; *and that they were immersed a sufficient time in the water, so as to be pretty much water soaken,* (though clean from slime or dirt) before the Experiments were made.

And also, that the respective Friction Planks and other bodies that were used in the Experiments of the year 1798 were planed smooth and painted, *but were not water soaken;* and also clean from slime or dirt. (See TABLE II. ON FRICTION).

From whence it is evident, that the Experiments of the year 1798 were not made precisely under the same circumstances as the Experiments of the year 1796:—that is, so far as relates to the resistance arising from the friction; for it is to be noticed, that when bodies have been immersed some time in the water, so as to be pretty much water soaken, the fibres of the wood start, and the surface becomes rougher than when such bodies were first immersed; therefore the resistance arising from the friction will be greater against the bodies that have been water soaken, as in the friction found by the Experiments of 1796; and which is proved to be the case by the following comparison:

Nautical miles per hour.....	1	2	3	4	5	6	7	8
	Motive Powers in Pounds and decimal parts of Pounds.							
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Friction against 1 square ft. of surface per Exp. 1796..	0.014	0.047	0.095	0.155	0.226	0.309	0.400	0.501
Friction against 1 square ft. of surface per Exp. 1798..	0.012	0.043	0.088	0.144	0.209	0.279	0.354	0.432

Now, as we had several opportunities of observing, that there was a material difference between the resistance of the bodies when drawn through the water, both before and after they were water soaken, and that they always met with more resistance after they were water soaken, we have therefore not the smallest doubt but the difference in the friction, as found above, arises from the aforesaid cause.

And it may be useful to observe, that we have occasionally drawn bodies through the water that have been immersed long enough to gather a little slime on them; and have immediately afterwards drawn the same bodies through the water by means of the same motive power, with the slime washed off, from whence we have always found that the bodies came the faster, when the slime had been washed off.

Upon considering the results of the various Experiments that we have made respecting the effect of the friction of the water on moving bodies; it is evident to us, that the resistance arising from the friction (even against very smooth surfaces), is considerably more than it has generally been conceived to be, or than has hitherto been accounted for, in the estimation of the resistance which bodies meet with in moving through water at different velocities. And from whence it naturally follows, that although ships may be built ever so much alike in their form and dimensions, yet still a very little difference in the smoothness of their bottoms (or in putting on the copper in coppered ships) will produce a considerable difference in their resistances, and of course in the comparative rate of their sailing.

In a note to CHAPTER II. we express how much we were indebted to Earl STANHOPE for the definitions he favoured us with; and in the same note, we acknowledge our gratitude (for a Theorem) to JOHN GARNETT, Esq., to whom, together with Messrs. RANDALL, BRENT, and SONS (particularly Mr. DANIEL BRENT), the Society are under the greatest obligations, for the ready assistance they have ever given to promote the object of the Experiments, and facilitate their execution; indeed, the liberality of these Gentlemen, and Messrs. WELLS, to whom the Society are indebted for the use of Greenland Dock, cannot be too highly estimated or too warmly acknowledged.

The following TABLES contain the Experiments made with the Long and Short Friction Planks, and are set down in the order in which they were made. For figures and dimensions, see pages 487 and 489.

TUESDAY, November 6, 1798.

Experiments made with the Conductor, bar, and Long Friction Plank, the centre of the plank being immersed six feet below the surface of the water.

Thermometer in the Air, 47°;—In the Water, 49°.—Water in the Dock, 12 feet 6 inches.

Motive Weight 12 lbs. avoirdupois, p. 488.

Experiment 1.

Sec.	Feet.	Differ.
4	5.75	5.75
8	16.35	10.60
12	29.62	13.27
16	43.57	13.95
20	57.30	13.73
24	70.72	13.42
28	84.15	13.43
32	97.63	13.48
36	111.00	13.37
40	124.42	13.42
44	137.90	13.48
46	144.70	6.80
48	151.48	6.78
50	158.26	6.78*
52	165.06	6.80
54	171.85	6.79

3)20.37

2) 6.79

Vel. per Exper. 3.395

Experiment 2.

Sec.	Feet.	Differ.
4)	3.55	3.55
	12.95	9.40
	25.50	12.55
	39.25	13.75
	53.12	13.87
	66.68	13.56
	79.92	13.24
	93.32	13.40
	106.65	13.33
	120.00	13.35
2)	133.32	13.32
	140.10	6.78
	146.78	6.68
	153.60	6.82*
	160.35	6.75
	167.10	6.75

3)20.32

2) 6.7733

2d Exper. . 3.3866
1st 3.3950

2) 6.7816

Mean 3.3908
Correction for line + 0.0173

Velocity per Second, with 12 lbs. Motive Weight . . . . . } 3.4081

Motive Weight 24 lbs. avoirdupois, p. 489.

Experiment 1.

Sec.	Feet.	Differ.
4)	5.70	5.70
	18.70	13.00
	36.50	17.80
	55.60	19.10
	74.90	19.30
	94.00	19.10
	113.20	19.20
2)	132.42	19.22
	142.13	9.71
	151.87	9.74*
	161.60	9.73
	171.30	9.70

.217

9.7233

Vel. per Sec. . . 4.8616

Experiment 2.

Sec.	Feet.	Differ.
4)	8.00	8.00
	23.40	15.40
	41.90	18.50
	61.10	19.20
	80.20	19.10
	99.60	19.40
	118.92	19.32
2)	128.63	9.71
	138.20	9.57
	148.00	9.80*
	157.70	9.70
	167.42	9.72

.222

9.7400

4.8700

Experiment 3.

Sec.	Feet.	Differ.
4)	7.65	7.65
	22.75	15.10
	41.25	18.50
	60.62	19.37
	79.85	19.23
	99.12	19.27
	118.50	19.38
2)	128.14	9.64
	137.80	9.66
	147.50	9.70*
	157.26	9.76
	166.95	9.69

.215

9.7167

3rd Exper. 4.8583
2d 4.8700
1st 4.8617

Sum 14.5900

Mean 4.8633
Correction for line + 0.0248

Velocity per Second, with 24 lbs. 4.8881

N.B. In these Experiments the upper part of the chain was hung 12 feet above the ground.

TUESDAY, November 6, 1798.

Conductor, bar, and Long Friction Plank, immersed six feet, &c.

Motive Weight 36 lbs. p. 490.

Experiment 1.

Sec.	Feet.	Differ.
4)	10.90	10.90
	29.60	18.70
	51.38	21.78
	73.90	22.52
2)	96.70	22.80
	108.22	11.52
	119.78	11.56
	131.40	11.62
	143.00	11.60*
	154.70	11.70
	166.32	11.62
		.192
		11.6400
		5.8200

Experiment 2.

Sec.	Feet.	Differ.
4)	9.72	9.72
	27.65	17.93
	49.10	21.45
	71.40	22.30
2)	94.00	22.60
	105.40	11.40
	116.90	11.50
	128.42	11.52
	140.08	11.66
	151.65	11.57*
	163.22	11.57
	174.80	11.58
		.172
		11.5733
		5.7866

Experiment 3.

Sec.	Feet.	Differ.
4)	9.60	9.60
	27.55	17.95
	49.05	21.50
	71.40	22.35
2)	94.05	22.65
	105.58	11.53
	117.10	11.52
	128.78	11.68
	140.35	11.57*
	152.02	11.67
	163.75	11.73
		.197
		11.6567
3d Exper.		5.8284
2d.....		5.7866
1st.....		5.8200
Sum		17.4350
Mean		5.8116
Correction for line +		0.0355
Velocity per Second, with 36 lbs.		5.8471

Motive Weight. 48 lbs. p. 491.

Experiment. 1.

Sec.	Feet.	Differ.
2)	4.90	4.90
	12.72	7.82
	22.95	10.23
	34.60	11.65
	46.78	12.18
	59.55	12.77
	72.20	12.65
	85.10	12.90
	98.12	13.02
	111.32	13.20
	124.55	13.23
	137.75	13.20*
	150.90	13.15
	164.20	13.30
		.65
		13.2167
		6.6083

Experiment 2.

Sec.	Feet.	Differ.
2)	6.10	6.10
	14.80	8.70
	25.70	10.90
	37.57	11.87
	50.00	12.43
	62.80	12.80
	75.70	12.90
	88.74	13.04
	101.93	13.19
	115.15	13.22
	128.43	13.28*
	141.73	13.30
	155.03	13.30
		.88
		13.2933
2d Exper.		6.6467
1st.....		6.6083
Sum		13.2550
Mean		6.6275
Correction for line +		0.0404
Velocity per Second, with 48 lbs.		6.6679

The upper part of the chain was hung 11 feet above the ground.

TUESDAY, November 6, 1798. THURSDAY, November 8, 1798.

Conductor, bar, and Long Friction Plank, immersed six feet, &c.

Thermometer in the Air, 54°;—In the Water, 49°.—Water in the Dock, 13 feet.

M. Wt. 96 lbs. p. 496. Experiment 2.			M. Wt. 120 lbs. p. 497. Experiment 1.			Motive Weight 60 lbs. p. 493. Experiment 1.			Experiment 3.			M. Wt. 72 lbs. p. 494. Experiment 2.		
Sec.	Feet.	Differ.	Sec.	Feet.	Differ.	Sec.	Feet.	Differ.	Sec.	Feet.	Differ.	Sec.	Feet.	Differ.
2)	5.40	5.40	2)	5.35	5.35	2)	4.40	4.40	2)	3.30	3.30	2)	4.72	4.72
	14.25	8.85		17.15	11.80		12.68	8.28		10.95	7.65		13.72	9.00
	30.45	16.20		32.88	15.73		24.05	11.37		21.70	10.75		26.15	12.43
	46.65	16.20		51.30	18.42		37.25	13.20		34.32	12.62		40.50	14.35
	63.95	17.30		70.55	19.25		51.40	14.15		48.30	13.98		55.65	15.15
	81.65	17.70		90.58	20.03		65.85	14.45		62.45	14.15		71.15	15.50
	99.87	18.22		110.85	20.27		80.65	14.80		77.10	14.65		86.90	15.75
	118.20	18.33		131.30	20.45*		95.30	14.65		91.70	14.60		102.68	15.78
	136.76	18.56*		151.80	20.50		110.10	14.80*		106.58	14.88		118.62	15.94
	155.22	18.46					124.90	14.80		121.24	14.66		134.84	16.22
										135.95	14.71		150.95	16.11*
		.102			.95			.160		150.65	14.70*		167.22	16.27
		18.5100			20.4750			14.80		165.35	14.70			.38
		9.2550			10.2375			7.4000			.140			16.1900
											14.70			8.0950
										3d Exper.	7.3500			
										1st	7.4000			
										Sum	14.7500			
										Mean	7.3750			
										Correction for line	+ 0.0449			
										Velocity per Second, with 60 lbs.	7.4199			

The upper part of the chain was hung 15 feet above the ground.

THURSDAY, November 8, 1798.

Conductor, bar, and Long Friction Plank, immersed six feet, &c.

M. Wt. 72 lbs. p. 494. — Experiment 1.

Sec.	Feet.	Differ.
2)	4.80	4.80
	14.00	9.20
	26.25	12.25
	40.45	14.20
	55.52	15.07
	71.12	15.60
	86.80	15.68
	102.72	15.92
	118.82	16.10
	135.03	16.21
	151.20	16.17*
	167.40	16.20
		.37
		16.1850

1st Exper. 8.0925
2d 8.0950

Sum 16.1875

Mean 8.0937

Cor. for line + 0.0672

Vel. per Sec. with 72 lbs. } 8.1609

Motive Weight 96 lbs. p. 495. — Experiment 1.

Sec.	Feet.	Differ.
2)	5.40	5.40
	16.15	10.75
	30.95	14.80
	47.55	16.60
	65.25	17.70
	83.22	17.97
	101.32	18.10
	119.90	18.58
	138.35	18.45*
	156.90	18.55
		.100
		18.50
		9.2500

Experiment 2.

Sec.	Feet.	Differ.
2)	5.60	5.60
	16.78	11.18
	31.45	14.67
	48.30	16.85
	65.80	17.50
	83.80	18.00
	101.92	18.12
	120.32	18.40
	138.80	18.48*
	157.30	18.50
		.98
		18.4900

2d Exper. 9.2450
1st 9.2500
6th Nov.. 9.2550

Sum 27.7500

Mean 9.2500
Correction for line + 0.0768

Velocity per Second, with 96 lbs. 9.3268

Motive Weight 120 lbs. p. 498. — Experiment 1.

Sec.	Feet.	Differ.
2)	7.12	7.12
	20.18	13.06
	37.28	17.10
	56.40	19.12
	76.25	19.85
	96.48	20.23
	117.02	20.54
	137.50	20.48*
	157.92	20.42
		.90
		20.45
		10.2250

Experiment 2.

Sec.	Feet.	Differ.
2)	9.10	9.10
	23.42	14.32
	41.30	17.88
	60.45	19.15
	80.55	20.10
	100.70	20.15
	121.15	20.45
	141.50	20.35*
	162.00	20.50
		.85
		20.4250

2d Exper. 10.2125
1st 10.2250
6th Nov.. 10.2375

Sum 30.6750

Mean 10.2250
Correction for line + 0.0848

Velocity per Second, with 120 lbs. 10.3098

The upper part of the chain was hung 15 feet above the ground.

FRIDAY, November, 9, 1798.

Experiments made with the Conductor, bar, and Short Friction Plank, the centre of the plank being immersed six feet below the surface of the water.

Thermometer in the Air, 49°;—In the Water, 49°.—Water in the Dock, 13 feet.

Motive Weight 24 lbs. p. 502.

Experiment 2.

Sec.	Feet.	Differ.
4	8.90	8.90
8	26.15	17.25
12	47.00	20.85
16	67.80	20.80
20	88.30	20.50
24	108.75	20.45
26	119.00	10.25
28	129.22	10.22
30	139.55	10.33
32	149.85	10.30
34	160.30	10.45*
36	170.75	10.45

2) 20.90

2) 10.45

5.225

Experiment 3.

Sec.	Feet.	Differ.
4)	8.05	8.05
	25.05	17.00
	45.55	20.50
	66.60	21.05
	87.12	20.52
2)	107.65	20.53
	117.80	10.15
	128.10	10.30
	138.40	10.30
	148.82	10.42
	159.28	10.46*
	169.80	10.52

20.98

10.4900

3d Exper. 5.2450
2d..... 5.2250

Sum 10.4700

Mean 5.2350
Correction for line + 0.0267

Velocity per Second, with 24 lbs. 5.2617

Motive Weight 36 lbs. p. 503.

Experiment 1.

Sec.	Feet.	Differ.
4)	10.55	10.55
	23.75	13.20
	43.90	20.15
	68.55	24.65
2)	93.15	24.60
	105.50	12.35
	117.88	12.38
	130.30	12.42
	142.80	12.50*
	155.32	12.52
	167.88	12.56

.158

12.5267

6.2633

Experiment 2.

Sec.	Feet.	Differ.
4)	12.10	12.10
	33.68	21.58
	58.00	24.32
	82.58	24.58
2)	94.92	12.34
	107.30	12.38
	119.80	12.50
	132.12	12.32
	144.70	12.58*
	157.22	12.52
	169.80	12.58

.168

12.5600

6.2800

Experiment 3.

Sec.	Feet.	Differ.
4)	9.50	9.50
	29.65	20.15
	53.62	23.97
	78.10	24.48
2)	102.75	24.65
	115.25	12.50
	127.65	12.40
	140.15	12.50*
	152.68	12.53
	165.25	12.57

.160

12.5333

3d Exper. 6.2667
2d..... 6.2800
1st..... 6.2633

Sum 18.8100

Mean 6.2700
Correction for line + 0.0382

Velocity per Second, with 36 lbs. 6.3082

The upper part of the chain was hung 15 feet above the ground.

FRIDAY, November 9, 1798.

Conductor, bar, and Short Friction Plank, immersed six feet, &c.

Motive Weight 48 lbs. p. 504.

Experiment 2.			Experiment 3.		
Sec.	Feet.	Differ.	Sec.	Feet.	Differ.
2)	3.55	3.55	2)	4.05	4.05
	11.30	7.75		12.40	8.35
	22.25	10.95		23.80	11.40
	35.00	12.75		36.72	12.92
	48.65	13.65		50.28	13.56
	62.60	13.95		64.00	13.72
	76.50	13.90		77.92	13.92
	90.32	13.82		91.72	13.80
	104.45	14.13		105.75	14.03
	118.45	14.00		119.75	14.00
	132.52	14.07		133.82	14.07
	146.70	14.18*		148.00	14.18*
	160.88	14.18		162.20	14.20
		.36			.38
		14.18			14.1900
		7.0900	3d Exper.		7.0950
			2d.....		7.0900
			Sum		14.1850
			Mean		7.0925
			Correction for line +		0.0433
			Velocity per Second, with 48 lbs.		7.1358

Motive Weight 60 lbs. p. 505.

Experiment 2.			Experiment 3.		
Sec.	Feet.	Differ.	Sec.	Feet.	Differ.
2)	5.50	5.50	2)	4.90	4.90
	15.45	9.95		14.35	9.45
	28.55	13.10		26.95	12.60
	43.10	14.55		41.60	14.65
	58.15	15.05		56.60	15.00
	73.62	15.47		71.95	15.35
	89.02	15.40		87.35	15.40
	104.63	15.61		102.80	15.45
	120.35	15.72		118.55	15.75
	136.10	15.75		134.10	15.55
	151.82	15.72*		149.85	15.75*
	167.60	15.78		165.55	15.70
		.150			.145
		15.7500			15.725
		7.8750	3d Exper.		7.8625
			2d.....		7.8750
			Sum		15.7375
			Mean		7.8687
			Correction for line +		0.0480
			Velocity per Second, with 60 lbs.		7.9167

The upper part of the chain was hung 15 feet above the ground.

SATURDAY, November 10, 1798.

Conductor, bar, and Short Friction Plank, immersed six feet, &c.

Thermometer in the Air, 48°;—In the Water, 48°.—Water in the Dock, 12 feet 9 inches.

Motive Weight 12 lbs. p. 500 and 501.

Experiment 2.

Sec.	Feet.	Differ.
4)	4.15	4.15
	15.80	11.65
	31.30	15.50
	47.71	16.41
	63.64	15.93
	78.82	15.18
	93.80	14.98
	108.45	14.65
2)	123.11	14.66
	130.39	7.28
	137.71	7.32
	144.94	7.23
	152.30	7.36
	159.60	7.30
	167.00	7.40*
	174.40	7.40
		.80
		7.40
		3.700

Experiment 1.

Sec.	Feet.	Differ.
4)	4.87	4.87
	16.23	11.36
	30.80	14.57
	45.90	15.10
	60.85	14.95
	75.50	14.65
	89.98	14.48
	104.43	14.45
2)	119.05	14.62
	126.30	7.25
	133.70	7.40
	141.05	7.35
	148.40	7.35
	155.75	7.35
	163.20	7.45*
	170.71	7.51
		.96
		7.48

1st Exper. 3.7400
2d..... 3.7000
Sum 7.4400
Mean 3.7200
Correction for line + 0.0190
Velocity per Second, with 12 lbs. 3.7390

Motive Weight 72 lbs. p. 507.

Experiment 1.

Sec.	Feet.	Differ.
2)	7.60	7.60
	19.40	11.80
	34.05	14.65
	49.80	15.75
	65.80	16.00
	82.20	16.40
	98.68	16.48
	115.60	16.92
	132.66	17.06*
	149.65	16.99
	166.70	17.05
		51.10
		17.0333
		8.5166

Experiment 2.

Sec.	Feet.	Differ.
2)	6.50	6.50
	17.40	10.90
	31.35	13.95
	47.00	15.65
	63.10	16.10
	79.45	16.35
	96.00	16.55
	112.88	16.88
	129.93	17.05*
	147.00	17.07
	164.12	17.12
		51.24
		17.0800

2d Exper. 8.5400
1st..... 8.5166
Sum 17.0566
Mean 8.5283
Correction for line + 0.0708
Velocity per Second, with 72 lbs. 8.5991

In the first Experiment made with the Motive Weight of 12 lbs. the upper part of the chain was 12 feet above the ground; in the second Experiment, 16 feet; and in the two last Experiments 14 feet.

Digitized by Google

SATURDAY, November, 10, 1798.

Conductor, bar, and Short Friction Plank, immersed six feet, &c.

Motive Weight 96 lbs. p. 506.						M. Wt. 120 lbs. p. 508		
Experiment 1.			Experiment 2.			Experiment 1.		
Sec.	Feet.	Differ.	Sec.	Feet.	Differ.	Sec.	Feet.	Differ.
2)	6.90	6.90	2)	7.25	7.25	2)	5.10	5.10
	19.85	12.95		20.35	13.10		17.60	12.50
	36.42	16.57		36.65	16.30		34.75	17.15
	54.55	18.13		54.70	18.05		54.10	19.35
	73.20	18.65		73.15	18.45		75.00	20.90
	92.25	19.05		92.38	19.23		95.95	20.95
	111.72	19.47		111.65	19.27		117.70	21.75
	131.32	19.60*		131.15	19.50*		139.30	21.60*
	150.70	19.38		150.68	19.53		161.15	21.85
	170.18	19.48		170.00	19.32			.145
		.146			.135			21.7250
		19.4867			19.4500			10.8625
		9.7433		2d Exper.	9.7250	Cor. for line +		0.0902
				1st.....	9.7433	Vel. per Sec. with 120 lbs.		10.9527
				Sum	19.4683			
				Mean	9.7341			
			Correction for line +		0.0808			
			Velocity per Second, with 96 lbs.		9.8149			

In the first two Experiments the upper part of the chain was 14 feet, and in the last Experiment 10 feet 6 inches above the ground.

CONCLUSION.

THE length of time which has elapsed since the Experiments were first undertaken, to the period of their Results being laid before the Public, has doubtless created some surprise in many Members of the Society; but we flatter ourselves the following reasons for this delay, which we submit to the candour of the Subscribers, may be thought sufficient for our justification.

In the first place we can assert, without fear of contradiction, that only those who attended assiduously at Greenland Dock, whilst the Experiments were making, can form an idea of the trouble occasioned by, or the time consumed in, the undertaking.

Second.—Our private concerns could not be altogether neglected.

Third.—The fatigue of making the Experiments, and the trouble of calculating their Results, equally contributed to prolong the operation; nor was the expence individually incurred by any means trifling.

Fourth.—The relative situation each held in Society, claimed a considerable portion of time and attention: one of the Gentlemen conducting the Experiments being an able and experienced Officer in the Navy, well known by his excellent Survey of some of the West India Islands, and now commanding a large and valuable Storeship, and the other holding a responsible situation in the Army.

It would be tedious to enumerate more of the many unavoidable causes which have contributed to the delay of the Publication; nor do we conceive the liberality of the Society will demand more in order to our exoneration from all blame on this head.

Examples have been given of the Experiments; but it was found expedient to publish (with those exceptions) the *Results* only, as the publication of the details would have involved an expence much beyond the limited means furnished by the funds of the Society.

The following Eight TABLES include the whole of the Report published by the Society.

TABLE I.
PART I.

REFERENCES TO THE FORM AND DIMENSIONS OF THE BODIES WITH

The following Bodies were respectively fixed to the Bar at n, and immersed to the medium depth of six feet under the surface of the water, the conductor then swam with its top surface exactly one inch above the surface of the water.	Page.	MOTIVE POWERS requisite to overcome the resistances of the opposite bodies, when they are moving at velocities in nautical miles per hour, as expressed underneath. NAUTICAL MILES per HOUR. 8	7	6	5	4	3	2	1	
		Motive Powers in Pounds and decimal parts of Pounds.								
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs	
New Conductor, Broad Bar	482	142.570	105.070	73.860	48.690	29.230	15.140	5.990	1.230	Resis. of the conductor and bar only.
The Long Friction Plank..	487	212.618	160.502	116.006	79.019	49.389	26.947	11.472	2.665	Resis. of cond. bar, & long frict. plank.
		70.048	55.432	42.146	30.329	20.159	11.807	5.482	1.435	Resistance of long friction plank alone.
The Short Friction Plank .	499	192.762	144.215	103.167	69.421	42.747	22.879	9.480	2.102	Resis. of cond. bar, & short frict. plank
		50.192	39.145	29.307	20.731	13.517	7.739	3.490	0.872	Resis. of short friction plank alone.
The Body Ao	509	184.16	137.92	98.48	66.12	40.61	21.66	8.93	1.96	Resistance of conductor, bar, and Ao
		41.59	32.85	24.62	17.43	11.38	6.52	2.94	0.73	Resistance of the body Ao alone.
——— Aa	514	184.64	137.49	98.12	65.83	40.40	21.52	8.86	1.94	Resistance of conductor, bar, and Aa.
		42.07	32.42	24.26	17.14	11.17	6.38	2.87	0.71	Resistance of the body Aa alone.
——— Ab	521	185.10	137.96	98.26	65.78	40.25	21.37	8.75	1.90	Resistance of conductor, bar, and Ab.
		42.53	32.89	24.40	17.09	11.02	6.23	2.76	0.67	Resistance of the body Ab alone.
——— Ac	526	189.43	141.71	101.36	68.20	41.99	22.47	9.31	2.06	Resistance of conductor, bar, and Ac
		46.86	36.64	27.50	19.51	12.76	7.33	3.32	0.83	Resistance of the body Ac alone.
——— Ad	532	187.68	140.43	100.48	67.62	41.65	22.30	9.24	2.05	Resistance of conductor, bar, and Ad.
		45.11	35.36	26.62	18.93	12.42	7.16	3.25	0.82	Resistance of the body Ad alone.
——— Ae	537	194.94	145.61	103.97	69.81	42.87	22.86	9.43	2.07	Resistance of conductor, bar, and Ae
		52.37	40.54	30.11	21.12	13.64	7.72	3.44	0.84	Resistance of the body Ae alone.
——— Af	543	219.01	163.72	117.00	78.64	48.36	25.83	10.68	2.36	Resistance of conductor, bar, and Af.
		76.44	58.65	43.14	29.95	19.13	10.69	4.69	1.13	Resistance of the body Af alone.

Note. — Deduct the resistance of the conductor and its bar, as found in the top line of these columns, from the resistance of the conductor, its bar, and the several bodies that were fixed thereto; then the remaining numbers will be the resistance of the different bodies respectively, and as found above in the second or under line of figures that are opposite to each body.

WHICH EXPERIMENTS WERE MADE AT GREENLAND DOCK IN THE YEAR 1798.

		VELOCITIES obtained by EXPERIMENT; and, also, as brought into a REGULAR SERIES by the method specified in CHAPTER II. of "The Report," &c.								
		MOTIVE POWERS in POUNDS Avoirdupoise.								
		12	24	36	48	60	72	96	120	Power of the Velocity
		VELOCITIES in FEET and decimal parts of FEET per SECOND.								
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	
The New Conductor and Broad bar	Velocity by Experiment.....	4.568	6.183	7.399	8.342	.....	10.033	.....	.....	2.2860
	The Regular Series.....	4.582	6.205	7.409	8.402	9.264	10.033	11.378	12.545	
The Long Friction Plank *	Velocity by Experiment	3.408	4.888	5.847	6.668	7.420	8.161	9.327	10.310	2.1060
	The Regular Series.....	3.455	4.801	5.821	6.673	7.419	8.090	9.273	10.310	
The Short Friction Plank.....	Velocity by Experiment	3.739	5.262	6.308	7.136	7.917	8.599	9.815	10.953	2.1779
	The Regular Series.....	3.770	5.186	6.250	7.134	7.906	8.598	9.815	10.877	
The Body Ao.....	Velocity by Experiment	3.828	5.376	.....	7.353	.....	8.770	10.028	.....	2.1849
	The Regular Series.....	3.872	5.317	6.401	7.302	8.087	8.791	10.028	11.106	
——— Aa.....	Velocity by Experiment	3.833	5.380	6.458	7.334	.....	8.808	10.045	.....	2.1886
	The Regular Series	3.884	5.332	6.417	7.318	8.104	8.808	10.045	11.123	
——— Ab.....	Velocity by Experiment	3.900	5.371	.....	7.307	.....	8.814	10.039	.....	2.2014
	The Regular Series	3.903	5.348	6.430	7.327	8.109	8.809	10.039	11.110	
——— Ac.....	Velocity by Experiment.....	.....	5.214	.....	7.166	.....	8.684	9.895	.....	2.1736
	The Regular Series	3.801	5.229	6.302	7.193	7.971	8.668	9.895	10.965	
——— Ad.....	Velocity by Experiment.....	3.797	5.289	.....	7.227	.....	8.736	9.935	.....	2.1719
	The Regular Series.....	3.814	5.248	6.325	7.221	8.002	8.702	9.935	11.010	
——— Ae.....	Velocity by Experiment.....	3.729	5.222	.....	7.220	.....	8.592	9.782	.....	2.1850
	The Regular Series	3.777	5.187	6.244	7.123	7.889	8.575	9.782	10.834	
——— Af.....	Velocity by Experiment	.....	4.898	.....	6.750	.....	8.141	9.265	.....	2.1792
	The Regular Series	3.568	4.904	5.907	6.741	7.468	8.119	9.265	10.264	

* The Long Friction Plank is of the same degree of smoothness as the Short Friction Plank, and has its respective Ends similar thereto (semicircular); but it is exactly 12 Feet longer than the Short Friction Plank. So that, including its Top and Bottom Edges, it contains exactly 46 Square Feet of *Surface* for Friction more than the said Short Friction Plank.

Digitized by Google

TABLE I. PART II.

REFERENCES TO THE FORM AND DIMENSIONS OF THE BODIES WITH

The following Bodies were respectively fixed to the Bar at n, and immersed to the medium depth of SIX FEET under the surface of the water, the conductor then swam with its top surface exactly one inch above the surface of the water.	Page.	MOTIVE POWERS requisite to overcome the RESISTANCES of the opposite BODIES, when they are moving at VELOCITIES in NAUTICAL MILES per HOUR, as expressed underneath.								
		NAUTICAL MILES per HOUR.								
		8	7	6	5	4	3	2	1	
		Motive Powers in Pounds and decimal parts of Pounds.								
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
The Body Ag.....	549	202.34	152.09	109.38	74.07	45.96	24.85	10.44	2.37	Resistance of conductor, bar, and Ag.
		59.77	47.02	35.52	25.38	16.73	9.71	4.45	1.14	Resistance of the body Ag alone.
——— Ah.....	555	196.77	147.16	105.23	70.77	43.55	23.29	9.64	2.13	Resistance of conductor, bar, and Ah.
		54.20	42.09	31.37	22.08	14.32	8.15	3.65	0.90	Resistance of the body Ah alone.
——— Ai.....	563	207.75	155.51	111.30	74.94	46.18	24.74	10.27	2.28	Resistance of conductor, bar, and Ai.
		65.18	50.44	37.44	26.25	16.95	9.60	4.28	1.05	Resistance of the body Ai alone.
——— Ba.....	569	182.79	136.15	96.90	64.81	39.61	21.00	8.58	1.86	Resistance of conductor, bar, and Ba.
		40.22	31.08	23.04	16.12	10.38	5.86	2.59	0.63	Resistance of the body Ba alone.
——— Ca.....	574	186.36	139.24	99.46	66.81	41.05	21.91	9.04	1.99	Resistance of conductor, bar, and Ca.
		43.79	34.17	25.60	18.12	11.82	6.77	3.05	0.76	Resistance of the body Ca alone.
——— Da.....	580	187.53	140.00	99.90	67.02	41.12	21.90	9.02	1.98	Resistance of conductor, bar, and Da.
		44.96	34.93	26.04	18.33	11.89	6.76	3.03	0.75	Resistance of the body Da alone.
——— Ea.....	586	193.25	144.39	103.13	69.27	42.56	22.71	9.37	2.06	Resistance of conductor, bar, and Ea.
		50.68	39.32	29.27	20.58	13.33	7.57	3.38	0.83	Resistance of the body Ea alone.
——— Fa.....	592	202.30	151.32	108.22	72.79	44.80	23.97	9.92	2.20	Resistance of conductor, bar, and Fa.
		59.73	46.25	34.36	24.10	15.57	8.83	3.93	0.97	Resistance of the body Fa alone.
——— Ga.....	598	184.74	137.64	97.98	65.56	40.09	21.26	8.70	1.89	Resistance of conductor, bar, and Ga.
		42.17	32.57	24.12	16.87	10.86	6.12	2.71	0.66	Resistance of the body Ga alone.
——— Ha.....	603	190.83	142.38	101.53	68.06	41.72	22.20	9.12	1.99	Resistance of conductor, bar, and Ha.
		48.26	37.31	27.67	19.37	12.49	7.06	3.13	0.76	Resistance of the body Ha alone.
——— Ho.....	610	191.85	143.17	102.11	68.47	41.99	22.35	9.19	2.01	Resistance of conductor, bar, and Ho.
		49.28	38.10	28.25	19.78	12.76	7.21	3.20	0.78	Resistance of the body Ho alone.
——— Ia	617	298.54	225.20	162.64	110.68	69.09	37.64	15.99	3.70	Resistance of conductor, bar, and Ia.
		155.97	120.13	88.78	61.99	39.86	22.50	10.00	2.47	Resistance of the body Ia alone.
——— Io.....	628	298.35	225.13	162.64	110.17	69.16	37.70	16.03	3.72	Resistance of conductor, bar, and Io.
		155.78	120.06	88.78	61.48	39.93	22.56	10.04	2.49	Resistance of the body Io alone.

Digitized by Google

WHICH EXPERIMENTS WERE MADE AT GREENLAND DOCK IN THE YEAR 1798.

		VELOCITIES obtained by EXPERIMENT; and, also, as brought into a REGULAR SERIES by the method specified in CHAPTER II. of "The Report," &c.								
		MOTIVE POWERS in POUNDS Avoirdupoise.								
		12	24	36	48	60	72	96	120	Power of the Velocity.
		VELOCITIES in FEET and decimal parts of FEET per SECOND.								
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	
The Body Ag.	Velocity by Experiment	3.588	5.009	.....	6.917	.....	8.341	9.545	.....	2.1383
	The Regular Series	3.610	4.991	6.034	6.902	7.662	8.344	9.545	10.595	
—— Ah.	Velocity by Experiment	3.707	5.223	6.234	7.076	7.867	8.522	9.758	.....	2.1757
	The Regular Series	3.740	5.143	6.197	7.073	7.837	8.522	9.727	10.777	
—— Ai	Velocity by Experiment	3.596	5.058	.....	6.935	.....	8.315	9.477	.....	2.1694
	The Regular Series	3.634	5.002	6.030	6.885	7.631	8.301	9.477	10.503	
—— Ba	Velocity by Experiment	3.920	5.431	.....	7.367	.....	8.835	10.103	.....	2.2061
	The Regular Series	3.936	5.390	6.477	7.379	8.164	8.868	10.103	11.178	
—— Ca	Velocity by Experiment	.....	5.306	.....	7.234	.....	8.751	9.982	.....	2.1825
	The Regular Series	3.850	5.289	6.369	7.266	8.048	8.749	9.982	11.057	
—— Da	Velocity by Experiment	3.827	5.344	.....	7.277	.....	8.751	9.963	.....	2.1893
	The Regular Series	3.854	5.289	6.365	7.259	8.038	8.736	9.963	11.032	
—— Ea	Velocity by Experiment	3.751	5.231	.....	7.224	.....	8.614	9.818	.....	2.1829
	The Regular Series	3.787	5.203	6.264	7.147	7.916	8.606	9.818	10.875	
—— Fa	Velocity by Experiment	.....	5.061	.....	7.005	.....	8.440	9.602	.....	2.1748
	The Regular Series	3.691	5.076	6.116	6.981	7.736	8.412	9.602	10.639	
—— Ga	Velocity by Experiment	.....	5.352	.....	7.351	.....	8.831	10.052	.....	2.2044
	The Regular Series	3.914	5.360	6.442	7.340	8.122	8.822	10.052	11.123	
—— Ha	Velocity by Experiment	3.774	.....	6.375	7.223	8.065	8.714	9.890	.....	2.1935
	The Regular Series	3.833	5.257	6.324	7.210	7.983	8.674	9.890	10.949	
—— Ho	Velocity by Experiment	3.726	5.255	6.351	7.212	7.936	8.620	9.802	10.921	2.1920
	The Regular Series	3.820	5.241	6.306	7.190	7.960	8.651	9.864	10.921	
—— Ia	Velocity by Experiment	2.935	4.083	.....	5.742	.....	6.920	7.920	8.785	2.1113
	The Regular Series	2.952	4.099	4.967	5.692	6.326	6.897	7.904	8.785	
—— Io	Velocity by Experiment	.....	4.081	.....	5.697	.....	6.934	7.958	8.784	2.1090
	The Regular Series	2.948	4.095	4.963	5.689	6.324	6.894	7.902	8.784	

Digitized by Google

TABLE I. PART III.

REFERENCES TO THE FORM AND DIMENSIONS OF THE BODIES WITH

The following BODIES were respectively immersed to the medium depth of SIX FEET under the surface of the water, by means of the conductor and its bar.	Page.	MOTIVE POWERS requisite to overcome the RESISTANCES of the opposite BODIES, when they are moving at VELOCITIES in NAUTICAL MILES per HOUR, as expressed underneath. NAUTICAL MILES per HOUR. 8	7	6	5	4	3	2	1	
		MOTIVE POWERS in POUNDS and decimal parts of POUNDS.								
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
The Conductor and Bar...	413	108.26	85.96	65.86	48.06	32.69	19.89	9.87	2.98	Resistance of the conductor and bar only.
Triangle M vertex foremost	421	172.87	135.95	103.01	74.19	49.65	29.59	14.26	4.10	Resis. of cond. bar, and M vertex foremost.
		64.61	49.99	37.15	26.13	16.96	9.70	4.39	1.12	Resis. of the body M vertex foremost alone.
——— M base foremost.	425	302.63	234.87	175.29	124.01	81.19	47.03	21.78	5.84	Resis. of cond. bar, and M with base foremost
		194.37	148.91	109.43	75.95	48.50	27.14	11.91	2.86	Resis. of body M with base foremost alone.
The Cube R	430	310.56	241.10	180.00	127.40	83.45	48.37	22.43	6.03	Resistance of conductor, bar, and body R.
		202.30	155.14	114.14	79.34	50.76	28.48	12.56	3.05	Resistance of the body R alone.
The Square Iron Plane S..	437	312.05	242.70	181.57	128.82	84.64	49.25	22.96	6.23	Resistance of conductor, bar, and body S.
		203.79	156.74	115.71	80.76	51.95	29.36	13.09	3.25	Resistance of the body S alone.
The Round Iron Plane T..	445	313.39	243.38	181.77	128.70	84.35	48.93	22.70	6.11	Resistance of conductor, bar, and body T.
		205.13	157.42	115.91	80.64	51.66	29.04	12.83	3.13	Resistance of the body T alone.
The Cylinder U.....	452	299.04	232.20	173.39	122.75	80.43	46.63	21.63	5.82	Resistance of conductor, bar, and body U.
		190.78	146.24	107.53	74.69	47.74	26.74	11.76	2.84	Resistance of the body U alone.
The Cylinder and Semiglobe W on stern end	459	276.23	214.33	159.92	113.10	74.02	42.85	19.83	5.32	Resistance of conductor, bar, and body W.
		167.97	128.37	94.06	65.04	41.33	22.96	9.96	2.34	Resistance of the body W alone.
The Cylinder and Semiglobe X on head end .	463	163.60	128.72	97.59	70.34	47.12	28.11	13.57	3.91	Resistance of conductor, bar, and body X.
		55.34	42.76	31.73	22.28	14.43	8.22	3.70	0.93	Resistance of the body X alone.
The Cylinder and Semiglobe Y on each end .	468	154.55	121.67	92.31	66.59	44.65	26.67	12.90	3.73	Resistance of conductor, bar, and body Y.
		46.29	35.71	26.45	18.53	11.96	6.78	3.03	0.75	Resistance of the body Y alone.
The Globe Z....	474	173.13	135.62	102.31	73.30	48.74	28.80	13.72	3.86	Resistance of conductor, bar, and body Z.
		64.87	49.66	36.45	25.24	16.05	8.91	3.85	0.88	Resistance of the body Z alone.

Digitized by Google

WHICH EXPERIMENTS WERE MADE AT GREENLAND DOCK IN THE YEAR 1797.

		VELOCITIES obtained by Experiment; and, also, as brought into a Regular Series by the method specified in Chapter II. of "The Report," &c.									
		MOTIVE POWERS in Pounds Avoirdupoise.									
		6	12	24	36	48	60	72	96	120	Power of the Velocity
		Velocities in Feet and decimal parts of Feet per Second.									
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	
The Conductor and Bar.....	Velocity by Experiment..	2.530	3.700	5.598	7.280	8.541	9.563	10.683	.....	.....	1.7276
	The Regular Series.....	2.535	3.787	5.656	7.152	8.448	9.613	10.683	12.619	14.358	
The Triangle M vertex foremost ..	Velocity by Experiment .	.....	3.056	.....	5.668	6.650	.....	8.315	.....	.....	1.7998
	The Regular Series.....	2.091	3.073	4.516	5.657	6.638	7.514	8.315	9.756	11.044	
———— M base foremost....	Velocity by Experiment .	.....	.....	3.578	.....	5.081	.....	6.280	7.388	8.279	1.8982
	The Regular Series.....	1.742	2.470	3.559	4.407	5.128	5.768	6.349	7.388	8.310	
The Cube R.....	Velocity by Experiment .	.....	.....	3.511	4.306	5.012	.....	6.249	.....	8.192	1.8958
	The Regular Series.....	1.687	2.432	3.505	4.341	5.052	5.683	6.257	7.282	8.192	
The Square Iron Plane S	Velocity by Experiment .	.....	2.412	3.445	.....	4.970	.....	6.224	7.237	8.142	1.8823
	The Regular Series	1.658	2.396	3.463	4.295	5.004	5.634	6.207	7.232	8.142	
The Round Iron Plane T	Velocity by Experiment .	.....	2.426	3.482	4.298	4.968	.....	6.213	7.315	8.148	1.8935
	The Regular Series	1.675	2.415	3.483	4.314	5.022	5.650	6.221	7.242	8.148	
The Cylinder U.....	Velocity by Experiment..	.....	2.478	3.568	4.432	5.131	.....	6.380	7.441	8.374	1.8946
	The Regular Series	1.719	2.478	3.573	4.425	5.151	5.795	6.380	7.426	8.355	
The Cylinder and Semi-globe W on stern end	Velocity by Experiment..	.....	2.616	3.663	.....	5.395	.....	6.672	7.756	.....	1.9000
	The Regular Series.....	1.803	2.596	3.739	4.629	5.385	6.057	6.666	7.756	8.723	
The Cylinder and Semi-globe X on head end.....	Velocity by Experiment..	.....	3.189	4.636	5.763	6.834	.....	8.593	.....	.....	1.7958
	The Regular Series	2.147	3.158	4.646	5.823	6.834	7.738	8.565	10.053	11.384	
The Cylinder and Semi-globe Y on each end.....	Velocity by Experiment .	.....	3.270	4.798	6.041	7.112	.....	.....	10.370	.....	1.7914
	The Regular Series	2.206	3.248	4.783	5.997	7.042	7.977	8.831	10.370	11.746	
The Globe Z	Velocity by Experiment..	.....	3.130	4.515	.....	6.838	.....	8.471	9.799	.....	1.8288
	The Regular Series.....	2.152	3.143	4.592	5.731	6.709	7.578	8.373	9.799	11.071	

Digitized by Google

TABLE I. PART IV.

REFERENCES TO THE FORM AND DIMENSIONS OF THE BODIES WITH W

The following BODIES were respectively immersed to the medium depth of SIX FEET under the surface of the water, by means of the conductor and its bars.—The middle part of the said BODIES, or Parallelopipedon P, (page 392,) is ten feet long, one foot broad, and one foot deep.	Page.	MOTIVE POWERS requisite to overcome the RESISTANCES of the opposite BODIES, when they are moving at VELOCITIES in NAUTICAL MILES per HOUR, as expressed underneath.								
		NAUTICAL MILES per HOUR.								
		8	7	6	5	4	3	2	1	
		Motive Powers in Pounds and decimal parts of Pounds.								
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
The Conductor and Bars..	325	108.45	84.04	62.61	44.20	28.87	16.67	7.68	2.05	Resistance of the conductor and bars only.
The Body APa.....	334	170.28	132.60	99.35	70.61	46.49	27.13	12.70	3.47	Resistance of conductor, bars, and APa.
		61.83	48.56	36.74	26.41	17.62	10.46	5.02	1.42	Resistance of the body APa alone.
——— APe.....	349	184.44	143.57	107.52	76.39	50.27	29.31	13.70	3.74	Resistance of conductor, bars, and APe.
		75.99	59.53	44.91	32.19	21.40	12.64	6.02	1.69	Resistance of the body APe alone.
——— APk.....	345	183.92	142.99	106.94	75.84	49.80	28.96	13.57	3.72	Resistance of conductor, bars, and APk.
		75.47	58.95	44.33	31.64	20.93	12.29	5.89	1.67	Resistance of the body APk alone.
——— APl.....	342	181.18	141.16	105.82	75.26	49.59	28.96	13.57	3.72	Resistance of conductor, bars, and APl.
		72.73	57.12	43.21	31.06	20.72	12.29	5.89	1.67	Resistance of the body APl alone.
——— APi.....	356	194.79	151.37	113.13	80.17	52.59	30.54	14.20	3.83	Resistance of conductor, bars, and APi.
		86.34	67.33	50.52	35.97	23.72	13.87	6.52	1.78	Resistance of the body APi alone.
——— EPa.....	361	181.50	141.33	105.86	75.22	49.51	28.88	13.51	3.68	Resistance of conductor, bars, and EPa.
		73.05	57.29	43.25	31.02	20.64	12.21	5.83	1.63	Resistance of the body EPa alone.
——— KPa.....	371	181.59	141.22	105.64	74.94	49.23	28.64	13.35	3.62	Resistance of conductor, bars, and KPa.
		73.14	57.18	43.03	30.74	20.36	11.97	5.67	1.57	Resistance of the body KPa alone.
——— LPa.....	376	179.73	139.85	104.69	74.33	48.88	28.47	13.29	3.61	Resistance of conductor, bars, and LPa.
		71.28	55.81	42.08	30.13	20.01	11.80	5.61	1.56	Resistance of the body LPa alone.
——— IPa.....	381	284.10	219.45	162.88	114.48	74.36	42.63	19.46	5.09	Resistance of conductor, bars, and IPa.
		175.65	135.41	100.27	70.28	45.49	25.96	11.78	3.04	Resistance of the body IPa alone.
——— IPi.....	392	306.92	236.90	175.69	123.36	80.03	45.81	20.87	5.44	Resistance of conductor, bars, and IPi.
		198.47	152.86	113.08	79.16	51.16	29.14	13.19	3.39	Resistance of the body IPi alone.
The Long Friction Plank. †	397	169.23	131.81	98.78	70.22	46.25	27.00	12.64	3.45	Resis. of cond. bars, and long friction plank.
		60.78	47.77	36.17	26.02	17.38	10.33	4.96	1.40	Resistance of the long friction plank alone.
The Short Friction Plank..	405	144.19	111.80	83.35	58.90	38.50	22.26	10.28	2.75	Resis. of cond. bars, and short friction plank.
		35.74	27.76	20.74	14.70	9.63	5.59	2.60	0.70	Resistance of the short friction plank alone.

† The Long Friction Plank contains exactly fifty square feet of surface for friction more than the Short Friction Plank.

Digitized by Google

WHICH EXPERIMENTS WERE MADE AT GREENLAND DOCK IN THE YEAR 1796.

		VELOCITIES obtained by Experiment; and, also, as brought into a Regular Series by the method specified in Chapter II. of "The Report," &c.										
		MOTIVE POWERS in Pounds Avoirdupoise.										
		6	12	24	36	48	60	72	96	120	144	Power of the Velocity.
		Velocities in Feet and decimal parts of Feet per Second.										
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	
The Conductor and Bars..	Velocity by Experiment .	.....	4.245	.....	7.650	8.886	9.922	10.971	.....	.....	.....	1.9095
	The Regular Series.....	2.971	4.271	6.140	7.593	8.828	9.922	10.916	12.691	14.264	15.693	
The Body APa.....	Velocity by Experiment .	2.281	3.316	4.729	5.820	6.818	7.753	8.543	.....	.....	.....	1.8728
	The Regular Series	2.267	3.282	4.752	5.900	6.880	7.751	8.543	9.961	11.222	12.369	
——— APe	Velocity by Experiment .	2.163	3.126	4.560	.....	*6.519	.....	8.102	.....	.....	.....	1.8752
	The Regular Series	2.177	3.151	4.560	5.661	6.599	7.433	8.192	9.550	10.757	11.856	
——— APk	Velocity by Experiment .	2.197	3.178	4.565	.....	6.633	.....	.....	.....	.....	.....	1.8848
	The Regular Series	2.201	3.179	4.592	5.694	6.633	7.467	8.225	9.581	10.785	11.881	
——— APl.....	Velocity by Experiment .	.....	3.167	4.582	.....	6.645	.....	8.257	.....	.....	.....	1.8693
	The Regular Series.....	2.185	3.166	4.588	5.699	6.647	7.490	8.257	9.631	10.852	11.963	
——— APi.....	Velocity by Experiment .	2.146	3.086	4.448	5.534	*6.366	*7.132	*7.815	.....	.....	.....	1.8890
	The Regular Series	2.143	3.094	4.465	5.534	6.444	7.252	7.987	9.301	10.467	11.528	
——— EPa	Velocity by Experiment .	2.220	3.175	4.554	5.613	6.620	7.494	.....	9.594	10.789	11.920	1.8742
	The Regular Series.....	2.194	3.175	4.596	5.706	6.653	7.494	8.260	9.630	.....	11.956	
——— KPa	Velocity by Experiment..	2.212	3.207	4.607	.....	6.655	7.513	.....	.....	.....	.....	1.8830
	The Regular Series.....	2.212	3.196	4.618	5.728	6.673	7.513	8.277	9.643	10.856	11.960	
——— LPa	Velocity by Experiment .	.....	3.203	4.630	.....	6.699	.....	*8.276	.....	.....	.....	1.8786
	The Regular Series.....	2.215	3.203	4.632	5.748	6.699	7.544	8.313	9.688	10.910	12.022	
——— IPa.....	Velocity by Experiment .	1.828	2.631	3.745	4.599	5.344	6.069	6.652	7.683	8.593	9.453	1.9338
	The Regular Series	1.840	2.634	3.769	4.648	5.394	6.054	6.652	7.719	8.663	9.520	
——— IPi.....	Velocity by Experiment .	.....	2.538	3.666	.....	5.167	.....	6.423	7.429	.....	.....	1.9392
	The Regular Series	1.778	2.542	3.635	4.480	5.196	5.830	6.405	7.429	8.335	9.157	
The Long Friction Plank .	Velocity by Experiment .	.....	3.325	.....	5.916	6.900	7.773	.....	10.053	.....	.....	1.8714
	The Regular Series	2.271	3.289	4.764	5.916	6.899	7.773	8.568	9.992	11.258	12.410	
The Short Friction Plank	Velocity by Experiment .	2.544	.....	5.277	6.522	7.555	8.475	9.395	.....	.....	.....	1.905
	The Regular Series	2.549	3.668	.....	6.530	7.594	8.548	9.395	10.927	12.284	13.518	

Note.—The Velocities marked thus * are doubtful Experiments, and therefore not used in computing the Regular Series.

Digitized by Google

TABLE II.
On FRICTION.

Showing the MOTIVE POWERS requisite to overcome the RESISTANCE arising from the FRICTION
And also the SQUARE FEET, and Decimal Parts of Square Feet,

Of the BODIES used in the Year 1798.	NAUTICAL MILES per HOUR. 1	2	3	4	5	6	7	8
	Motive Powers in Pounds and decimal parts of Pounds.							
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
From the Motive Power requisite to overcome the Resistance of the Long Friction Plank as found in *Table I. Part I.*	1.435	5.482	11.807	20.159	30.329	42.146	55.432	70.048
Deduct the Motive Power requisite to overcome the Resistance of the Short Friction Plank as found in *Table I. Part I.*	0.872	3.490	7.739	13.517	20.731	29.307	39.145	50.192
Remains the Motive Power requisite to overcome the Resistance arising from the Friction alone of the Water against 46 square feet of surface, and from whence the effect of the Friction of the Water against the several surfaces of the following Bodies is computed according to the proportion which the said surfaces respectively bear to 46 square feet.	0.563	1.992	4.068	6.642	9.598	12.839	16.287	19.856
The Body Ao contains..... In its top surface 4.71	0.058	0.20	0.42	0.68	0.98	1.31	1.67	2.03
Sides and bottom surface.. 21.71 Friction..	0.266	0.95	1.91	3.13	4.53	6.06	7.68	9.37
Total surface 26.42	0.324	1.15	2.33	3.81	5.51	7.37	9.35	11.40
——— Aa contains..... In its top surface 3.96	0.048	0.17	0.35	0.57	0.83	1.11	1.40	1.71
Sides and bottom surface.. 17.96 Friction..	0.220	0.78	1.57	2.59	3.75	5.01	6.36	7.75
Total surface..... 21.92	0.268	0.95	1.92	3.16	4.58	6.12	7.76	9.46
——— Ab or Ba contains.. In its top surface 4.26	0.052	0.18	0.38	0.62	0.89	1.19	1.51	1.84
Sides and bottom surface. 18.28 Friction..	0.224	0.79	1.62	2.64	3.81	5.10	6.47	7.89
Total surface..... 22.54	0.276	0.97	2.00	3.26	4.70	6.29	7.98	9.73
——— Ac or Ca contains.. In its top surface 4.80	0.059	0.21	0.42	0.69	1.00	1.34	1.70	2.07
Sides and bottom surface . 18.85 Friction..	0.231	0.82	1.67	2.72	3.93	5.26	6.67	8.14
Total surface..... 23.65	0.290	1.03	2.09	3.41	4.93	6.60	8.37	10.21
——— Ad or Da contains.. In its top surface 3.45	0.042	0.15	0.31	0.50	0.72	0.96	1.22	1.49
Sides and bottom surface . 15.45 Friction..	0.189	0.67	1.37	2.23	3.22	4.31	5.47	6.67
Total surface..... 18.90	0.231	0.82	1.68	2.73	3.94	5.27	6.69	8.16
——— Ae or Ea contains.. In its top surface 3.19	0.039	0.14	0.28	0.46	0.67	0.89	1.13	1.38
Sides and bottom surface.. 14.19 Friction..	0.174	0.61	1.26	2.05	2.96	3.96	5.02	6.13
Total surface..... 17.38	0.213	0.75	1.54	2.51	3.63	4.85	6.15	7.51
——— Af or Fa contains .. In its top surface 2.91	0.036	0.13	0.26	0.42	0.61	0.81	1.03	1.26
Sides and bottom surface.. 12.91 Friction..	0.158	0.56	1.14	1.86	2.69	3.60	4.57	5.57
Total surface..... 15.82	0.194	0.69	1.40	2.28	3.30	4.41	5.60	6.83
——— Ag or Ga contains.. In its top surface 3.09	0.038	0.13	0.27	0.45	0.64	0.86	1.09	1.33
Sides and bottom surface.. 13.19 Friction..	0.161	0.57	1.17	1.90	2.75	3.68	4.67	5.69
Total surface..... 16.28	0.199	0.70	1.44	2.35	3.39	4.54	5.76	7.02
——— Ah or Ha contains.. In its top surface 2.87	0.035	0.12	0.25	0.41	0.60	0.80	1.02	1.24
Sides and bottom surface.. 12.44 Friction..	0.152	0.54	1.10	1.80	2.60	3.47	4.40	5.37
Total surface..... 15.31	0.187	0.66	1.35	2.21	3.20	4.27	5.42	6.61
——— Ai or Ia contains .. In its top surface 2.48	0.030	0.11	0.22	0.36	0.52	0.69	0.88	1.07
Sides and bottom surface.. 10.48 Friction..	0.128	0.45	0.93	1.51	2.19	2.93	3.71	4.52
Total surface..... 12.96	0.158	0.56	1.15	1.87	2.71	3.62	4.59	5.59
——— Ho contains..... In its top surface 3.62	0.045	0.16	0.32	0.52	0.76	1.01	1.28	1.56
Sides and bottom surface.. 16.19 Friction..	0.198	0.70	1.42	2.34	3.38	4.52	5.73	6.99
Total surface..... 19.81	0.243	0.86	1.74	2.86	4.14	5.53	7.01	8.55
——— Io contains..... In its top surface 3.23	0.040	0.14	0.29	0.47	0.67	0.90	1.14	1.39
Sides and bottom surface.. 14.23 Friction..	0.174	0.61	1.25	2.05	2.97	3.97	5.03	6.14
Total surface..... 17.46	0.214	0.75	1.54	2.52	3.64	4.87	6.17	7.53

The Friction as found by these Experiments is applicable to surfaces that are planed smooth and painted (and not water soaken), such as the Bodies used in the Years 1798 and 1797.

lone of the WATER, which takes place against the several surfaces of the different BODIES respectively:—
hich are contained in the said Surfaces of the said Bodies respectively.

Of the BODIES used in the Year 1797.	NAUTICAL MILES per HOUR. 1	2	3	4	5	6	7	8
	Motive Powers in Pounds and decimal parts of Pounds.							
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs	lbs.	lbs.
The Total Surface which is contained in the two sides and top and bottom of the Triangle M is ..... 8.96 Friction..	0.110	0.39	0.79	1.29	1.87	2.50	3.17	3.87
The Total Surface which is contained in the two sides and top and bottom of the Body R is ..... 4.00 Friction..	0.049	0.17	0.35	0.58	0.83	1.12	1.42	1.73
The Total Circular Surface which is contained in the Bodies U or Z is each..... 4.00 Friction..	0.049	0.17	0.35	0.58	0.83	1.12	1.42	1.73
The Total Circular Surface which is contained in the Bodies W or X is each..... 6.00 Friction..	0.073	0.26	0.53	0.87	1.25	1.67	2.12	2.59
The Total Circular Surface which is contained in the Body Y is ..... 8.00 Friction..	0.098	0.34	0.71	1.16	1.67	2.23	2.83	3.45
Of the BODIES used in the Year 1796.								
From the Motive Power requisite to overcome the Resistance of the Long Friction Plank as found in *Table I. Part IV.*	1.40	4.96	10.33	17.38	26.02	36.17	47.77	60.78
Deduct the Motive Power requisite to overcome the Resistance of the Short Friction Plank as found in *Table I. Part IV.*	0.70	2.60	5.59	9.63	14.70	20.74	27.76	35.74
Remains the Motive Power requisite to overcome the Resistance arising from the Friction alone of the Water against 50 square feet of surface, and from whence the effect of the Friction against the several surfaces of the following Bodies is computed according to the proportion which the said surfaces respectively bear to 50 square feet.....	0.70	2.36	4.74	7.75	11.32	15.43	20.01	25.04
The Body APa contains..... In its top surface..... 12.96	0.18	0.61	1.23	2.01	2.93	4.00	5.19	6.49
Sides and bottom surface. 44.96 Friction..	0.63	2.12	4.26	6.97	10.18	13.84	17.99	22.52
Total surface 57.92	0.81	2.73	5.49	8.98	13.11	17.84	23.18	29.01
——— APe or EPa contains In its top surface..... 12.19	0.17	0.58	1.16	1.89	2.76	3.76	4.88	6.10
Sides and bottom surface. 41.19 Friction..	0.58	1.94	3.90	6.38	9.33	12.71	16.48	20.63
Total surface 53.38	0.75	2.52	5.06	8.27	12.09	16.47	21.36	26.73
——— APk or KPa contains In its top surface..... 14.31	0.20	0.68	1.36	2.22	3.24	4.42	5.73	7.17
Sides and bottom surface. 43.31 Friction..	0.61	2.04	4.11	6.71	9.81	13.37	17.33	21.70
Total surface 57.62	0.81	2.72	5.47	8.93	13.05	17.79	23.06	28.87
——— APl or LPa contains In its top surface..... 14.74	0.21	0.70	1.40	2.28	3.34	4.55	5.90	7.38
Sides and bottom surface. 44.21 Friction..	0.62	2.09	4.19	6.85	10.01	13.64	17.69	22.14
Total surface 58.95	0.83	2.79	5.59	9.13	13.35	18.19	23.59	29.52
——— APi or IPa contains In its top surface..... 11.48	0.16	0.54	1.09	1.78	2.60	3.54	4.59	5.75
Sides and bottom surface. 37.48 Friction..	0.53	1.77	3.55	5.81	8.49	11.57	15.00	18.77
Total surface 48.96	0.69	2.31	4.64	7.59	11.09	15.11	19.59	24.52
——— IPi contains..... In its top surface..... 10.00	0.14	0.47	0.95	1.55	2.26	3.09	4.00	5.01
Sides and bottom surface. 30.00 Friction..	0.42	1.42	2.84	4.65	6.79	9.26	12.01	15.02
Total surface 40.00	0.56	1.89	3.79	6.20	9.05	12.35	16.01	20.03

The Friction as found by these Experiments is applicable to such surfaces as have been planed smooth and painted, and immersed a considerable time in the water, so as to be pretty much water soaken (but clean from slime or dirt), such as the Bodies used in the year 1796.

Digitized by Google

TABLE III. PART I.

ANALYSIS of the TOTAL RESISTANCE

Showing at one View the MOTIVE POWER which is requisite to overcome the VARIOUS

	Of the BODIES used in the Year 1798.		NAUTICAL MILES per HOUR.							
			1	2	3	4	5	6	7	8
			MOTIVE POWERS in POUNDS and decimal parts of POUNDS.							
Horizontal Sections. Direction of Motion. A o	*From the*	Total Resistance *of* A o *per Table* 1 ...	lbs. 0.73	lbs. 2.94	lbs. 6.52	lbs. 11.38	lbs. 17.43	lbs. 24.62	lbs. 32.85	lbs. 42.07
	Deduct	Friction *on Top Surface, Table* 2	0.06	0.20	0.42	0.68	0.98	1.31	1.67	2.03
	Remains	Resistance *as a* Ship	0.67	2.74	6.10	10.70	16.45	23.31	31.18	40.04
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.27	0.95	1.91	3.13	4.53	6.06	7.68	9.37
	Remains	Plus *and* Minus Pressures.....	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Then deduct	Minus Pressure, *see* CHAP. V.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Remains	Plus Pressure *of Head End* A	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
B a	*From the*	Total Resistance *of* B a, *Table* 1.....	0.63	2.59	5.86	10.38	16.12	23.04	31.08	40.22
	Deduct	Friction *on Top Surface, Table* 2	0.05	0.18	0.38	0.62	0.89	1.19	1.51	1.84
	Remains	Resistance *as a* Ship	0.58	2.41	5.48	9.76	15.23	21.85	29.57	38.38
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.22	0.79	1.62	2.64	3.81	5.10	6.47	7.89
	Remains	Plus *and* Minus Pressures.....	0.36	1.62	3.86	7.12	11.42	16.75	23.10	30.49
	Then deduct	Minus Pressure *of* a *as opposite*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* B.....	0.32	1.49	3.59	6.68	10.78	15.86	21.94	29.03
C a	*From the*	Total Resistance *of* C a, *Table* 1.....	0.76	3.05	6.77	11.82	18.12	25.60	34.17	43.79
	Deduct	Friction *on Top Surface, Table* 2	0.06	0.21	0.42	0.69	1.00	1.34	1.70	2.07
	Remains	Resistance *as a* Ship.....	0.70	2.84	6.35	11.13	17.12	24.26	32.47	41.72
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.23	0.82	1.67	2.72	3.93	5.26	6.67	8.14
	Remains	Plus *and* Minus Pressures.....	0.47	2.02	4.68	8.41	13.19	19.00	25.80	33.58
	Then deduct	Minus Pressure *of* a *as opposite*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* C.....	0.43	1.89	4.41	7.97	12.55	18.11	24.64	32.12
D a	*From the*	Total Resistance *of* D a, *Table* 1.....	0.75	3.03	6.76	11.89	18.33	26.04	34.93	44.96
	Deduct	Friction *on Top Surface, Table* 2.....	0.04	0.15	0.31	0.50	0.72	0.96	1.22	1.49
	Remains	Resistance *as a* Ship.....	0.71	2.88	6.45	11.39	17.61	25.08	33.71	43.47
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.19	0.67	1.37	2.23	3.22	4.31	5.47	6.67
	Remains	Plus *and* Minus Pressures.....	0.52	2.21	5.08	9.16	14.39	20.77	28.24	36.80
	Then deduct	Minus Pressure *of* a *as opposite*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* D	0.48	2.08	4.81	8.72	13.75	19.88	27.08	35.34
E a	*From the*	Total Resistance *of* E a, *Table* 1.....	0.83	3.38	7.57	13.33	20.58	29.27	39.32	50.68
	Deduct	Friction *on Top Surface, Table* 2	0.04	0.14	0.28	0.46	0.67	0.89	1.13	1.38
	Remains	Resistance *as a* Ship	0.79	3.24	7.29	12.87	19.91	28.38	38.19	49.30
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.17	0.61	1.26	2.05	2.96	3.96	5.02	6.13
	Remains	Plus *and* Minus Pressures.....	0.62	2.63	6.03	10.82	16.95	24.42	33.17	43.17
	Then deduct	Minus Pressure *of* a *as opposite*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* E.....	0.58	2.50	5.76	10.38	16.31	23.53	32.01	41.71

Digitized by Google

of the DIFFERENT BODIES respectively;—

RESISTANCES of the DIFFERENT BODIES as applicable to practice, and as specified below.

	Of the BODIES used in the Year 1798.		NAUTICAL MILES per HOUR.							
			1	2	3	4	5	6	7	8
			Motive Powers in Pounds and decimal parts of Pounds.							
Horizontal Sections. Direction of Motion.			lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
	From the	Total Resistance *of* A a *per Table* 1....	0.71	2.87	6.38	11.17	17.14	24.26	32.42	41.59
	Deduct	Friction *on Top Surface, Table* 2	0.05	0.17	0.35	0.57	0.83	1.11	1.40	1.71
	Remains	Resistance *as a* Ship	0.66	2.70	6.03	10.60	16.31	23.15	31.02	39.88
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.22	0.78	1.57	2.59	3.75	5.01	6.36	7.75
	Remains	Plus *and* Minus Pressures.....	0.44	1.92	4.46	8.01	12.56	18.14	24.66	32.13
	Then deduct	Plus Pressure *of* A *as opposite*	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* a	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	From the	Total Resistance *of* A b, *Table* 1	0.67	2.76	6.23	11.02	17.09	24.40	32.89	42.53
	Deduct	Friction *on Top Surface, Table* 2.....	0.05	0.18	0.38	0.62	0.89	1.19	1.51	1.84
	Remains	Resistance *as a* Ship	0.62	2.58	5.85	10.40	16.20	23.21	31.38	40.69
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.22	0.79	1.62	2.64	3.81	5.10	6.47	7.89
	Remains	Plus *and* Minus Pressures.....	0.40	1.79	4.23	7.76	12.39	18.11	24.91	32.80
	Then deduct	Plus Pressure *of* A *as opposite*	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* b	0.00	0.00	0.04	0.19	0.47	0.86	1.41	2.13
	From the	Total Resistance *of* A c, *Table* 1	0.83	3.32	7.33	12.76	19.51	27.50	36.64	46.86
	Deduct	Friction *on Top Surface, Table* 2.....	0.06	0.21	0.42	0.69	1.00	1.34	1.70	2.07
	Remains	Resistance *as a* Ship	0.77	3.11	6.91	12.07	18.51	26.16	34.94	44.79
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.23	0.82	1.67	2.72	3.93	5.26	6.67	8.14
	Remains	Plus *and* Minus Pressures.....	0.54	2.29	5.24	9.35	14.58	20.90	28.27	36.65
	Then deduct	Plus Pressure *of* A *as opposite*	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* c.....	0.14	0.50	1.05	1.78	2.66	3.65	4.77	5.98
	From the	Total Resistance *of* A d *Table* 1	0.82	3.25	7.16	12.42	18.93	26.62	35.36	45.11
	Deduct	Friction *on Top Surface, Table* 2	0.04	0.15	0.31	0.50	0.72	0.96	1.22	1.49
	Remains	Resistance *as a* Ship.....	0.78	3.10	6.85	11.92	18.21	25.66	34.14	43.62
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.19	0.67	1.37	2.23	3.22	4.31	5.47	6.67
	Remains	Plus *and* Minus Pressures.....	0.59	2.43	5.48	9.69	14.99	21.35	28.67	36.95
	Then deduct	Plus Pressure *of* A *as opposite*	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* d	0.19	0.64	1.29	2.12	3.07	4.10	5.17	6.28
	From the	Total Resistance *of* A e, *Table* 1	0.84	3.44	7.72	13.64	21.12	30.11	40.54	52.37
	Deduct	Friction *on Top Surface, Table* 2	0.04	0.14	0.28	0.46	0.67	0.89	1.13	1.38
	Remains	Resistance *as a* Ship	0.80	3.30	7.44	13.18	20.45	29.22	39.41	50 99
	Then deduct	Friction *on Sides and Bottom, Table* 2..	0.17	0.61	1.26	2.05	2.96	3.96	5.02	6.13
	Remains	Plus *and* Minus Pressures.....	0.63	2.69	6.18	11.13	17.49	25.26	34.39	44.86
	Then deduct	Plus Pressure *of* A *as opposite*	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* e	0.23	0.90	1.99	3.56	5.57	8.01	10.89	14.19

Digitized by Google

TABLE III. PART II.

ANALYSIS of the TOTAL RESISTANCE

Showing at one View the MOTIVE POWER which is requisite to overcome the VARIOUS

	Of the BODIES used in the Year 1798.		NAUTICAL MILES per HOUR. 1	2	3	4	5	6	7	8
			Motive Powers in Pounds and decimal parts of Pounds.							
Horizontal Sections. Direction of Motion.	*From the*	Total Resistance *of* F a *per Table* 1 ...	lbs. 0.97	lbs. 3.93	lbs. 8.83	lbs. 15.57	lbs. 24.10	lbs. 34.36	lbs. 46.25	lbs. 59.73
	Deduct	Friction *on Top Surface, Table* 2	0.04	0.13	0.26	0.42	0.61	0.81	1.03	1.26
	Remains	Resistance *as a* Ship	0.93	3.80	8.57	15.15	23.49	33.55	45.22	58.47
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.16	0.56	1.14	1.86	2.69	3.60	4.57	5.57
	Remains	Plus *and* Minus Pressures.....	0.77	3.24	7.43	13.29	20.80	29.95	40.65	52.90
	Then deduct	Minus Pressure *of* a, *before found*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* F	0.73	3.11	7.16	12.85	20.16	29.06	39.49	51.44
	From the	Total Resistance *of* G a, *Table* 1.....	0.66	2.71	6.12	10.86	16.87	24.12	32.57	42.17
	Deduct	Friction *on Top Surface, Table* 2	0.04	0.13	0.27	0.45	0.64	0.86	1.09	1.33
	Remains	Resistance *as a* Ship	0.62	2.58	5.85	10.41	16.23	23.26	31.48	40.84
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.16	0.57	1.17	1.90	2.75	3.68	4.67	5.69
	Remains	Plus *and* Minus Pressures.....	0.46	2.01	4.68	8.51	13.48	19.58	26.81	35.15
	Then deduct	Minus Pressure *of* a, *before found*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* G	0.42	1.88	4.41	8.07	12.84	18.69	25.65	33.69
	From the	Total Resistance *of* H a, *Table* 1.....	0.76	3.13	7.06	12.49	19.37	27.67	37.31	48.26
	Deduct	Friction *on Top Surface, Table* 2	0.04	0.12	0.25	0.41	0.60	0.80	1.02	1.24
	Remains	Resistance *as a* Ship.....	0.72	3.01	6.81	12.08	18.77	26.87	36.29	47.02
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.15	0.54	1.10	1.80	2.60	3.47	4.40	5.37
	Remains	Plus *and* Minus Pressures.....	0.57	2.47	5.71	10.28	16.17	23.40	31.89	41.65
	Then deduct	Minus Pressure *of* a, *before found*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* H	0.53	2.34	5.44	9.84	15.53	22.51	30.73	40.19
Compare the Plus Pressure of H, as here found, with the Plus Pressure of H as found above by way of verification.	*From the*	Total Resistance *of* H o, *Table* 1.....	0.78	3.20	7.21	12.76	19.78	28.25	38.10	49.28
	Deduct	Friction *on Top Surface, Table* 2.....	0.05	0.16	0.32	0.52	0.76	1.01	1.28	1.56
	Remains	Resistance *as a* Ship.....	0.73	3.04	6.89	12.24	19.02	27.24	36.82	47.72
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.20	0.70	1.42	2.34	3.38	4.52	5.73	6.99
	Remains	Plus *and* Minus Pressures.....	0.53	2.34	5.47	9.90	15.64	22.72	31.09	40.73
	Then deduct	Minus Pressure *of* o, Chap. V.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Remains	Plus Pressure *of Head End* H	0.53	2.34	5.47	9.90	15.64	22.72	31.09	40.73
	From the	Total Resistance *of* I a, *Table* 1	2.47	10.00	22.50	39.86	61.99	88.78	120.13	155.97
	Deduct	Friction *on Top Surface, Table* 2	0.03	0.11	0.22	0.36	0.52	0.69	0.88	1.07
	Remains	Resistance *as a* Ship	2.44	9.89	22.28	39.50	61.47	88.09	119.25	154.90
	Then deduct	Friction *on Sides and Bottom, Table* 2.	0.13	0.45	0.93	1.51	2.19	2.93	3.71	4.52
	Remains	Plus *and* Minus Pressures.....	2.31	9.44	21.35	37.99	59.28	85.16	115.54	150.38
	Then deduct	Minus Pressure *of* a, *before found*	0.04	0.13	0.27	0.44	0.64	0.89	1.16	1.46
	Remains	Plus Pressure *of Head End* I	2.27	9.31	21.08	37.55	58.64	84.27	114.38	148.92

Digitized by Google

of the DIFFERENT BODIES respectively;—
RESISTANCES of the DIFFERENT BODIES as applicable to practice, and as specified below.

	Of the BODIES used in the Year 1798.	NAUTICAL MILES per HOUR. 1	2	3	4	5	6	7	8
		Motive Powers in Pounds and decimal parts of Pounds.							
Horizontal Sections. Direction of Motion.		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
	From the Total Resistance *of* A f *per Table* 1. . . .	1.13	4.69	10.69	19.13	29.95	43.14	58.65	76.44
	Deduct Friction *on Top Surface, Table* 2	0.04	0.13	0.26	0.42	0.61	0.81	1.03	1.26
	Remains Resistance *as a* Ship	1.09	4.56	10.43	18.71	29.34	42.33	57.62	75.18
	Then deduct Friction *on Sides and Bottom, Table* 2 .	0.16	0.56	1.14	1.86	2.69	3.60	4.57	5.57
	Remains Plus *and* Minus Pressures.	0.93	4.00	9.29	16.85	26.65	38.73	53.05	69.61
	Then deduct Plus Pressure *of* A, *before found*	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains Minus Pressure *of Stern End* f	0.53	2.21	5.10	9.28	14.73	21.48	29.55	38.94
	From the Total Resistance *of* A g, *Table* 1	1.14	4.45	9.71	16.73	25.38	35.52	47.02	59.77
	Deduct Friction *on Top Surface, Table* 2.	0.04	0.13	0.27	0.45	0.64	0.86	1.09	1.33
	Remains Resistance *as a* Ship	1.10	4.32	9.44	16.28	24.74	34.66	45.93	58.44
	Then deduct Friction *on Sides and Bottom, Table* 2 .	0.16	0.57	1.17	1.90	2.75	3.68	4.67	5.69
	Remains Plus *and* Minus Pressures.	0.94	3.75	8.27	14.38	21.99	30.98	41.26	52.75
	Then deduct Plus Pressure *of* A, *before found*.	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains Minus Pressure *of Stern End* g	0.54	1.96	4.08	6.81	10.07	13.73	17.76	22.08
	From the Total Resistance *of* A h, *Table* 1	0.90	3.65	8.15	14.32	22.08	31.37	42.09	54.20
	Deduct Friction *on Top Surface, Table* 2.	0.04	0.12	0.25	0.41	0.60	0.80	1.02	1.24
	Remains Resistance *as a* Ship	0.86	3.53	7.90	13.91	21.48	30.57	41.07	52.96
	Then deduct Friction *on Sides and Bottom, Table* 2 .	0.15	0.54	1.10	1.80	2.60	3.47	4.40	5.37
	Remains Plus *and* Minus Pressures.	0.71	2.99	6.80	12.11	18.88	27.10	36.67	47.59
	Then deduct Plus Pressure *of* A *found before*	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains Minus Pressure *of Stern End* h.	0.31	1.20	2.61	4.54	6.96	9.85	13.17	16.92
	From the Total Resistance *of* A i, *Table* 1	1.05	4.28	9.60	16.95	26.25	37.44	50.44	65.18
	Deduct Friction *on Top Surface, Table* 2	0.03	0.11	0.22	0.36	0.52	0.69	0.88	1.07
	Remains Resistance *as a* Ship.	1.02	4.17	9.38	16.59	25.73	36.75	49.56	64.11
	Then deduct Friction *on Sides and Bottom, Table* 2 .	0.13	0.45	0.93	1.51	2.19	2.93	3.71	4.52
	Remains Plus *and* Minus Pressures.	0.89	3.72	8.45	15.08	23.54	33.82	45.85	59.59
	Then deduct Plus Pressure *of* A, *before found*.	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains Minus Pressure *of Stern End* i.	0.49	1.93	4.26	7.51	11.62	16.57	22.35	28.92
Compare the Plus Pressure of I, as here found, with the Plus Pressure of I as found opposite by way of verification.									
	From the Total Resistance *of* I o, *Table* 1.	2.49	10.04	22.56	39.93	62.02	88.78	120.06	155.78
	Deduct Friction *on Top Surface, Table* 2	0.04	0.14	0.29	0.47	0.67	0.90	1.14	1.39
	Remains Resistance *as a* Ship	2.45	9.90	22.27	39.46	61.35	87.88	118.92	154.39
	Then deduct Friction *on Sides and Bottom, Table* 2. .	0.17	0.61	1.25	2.05	2.97	3.97	5.03	6.14
	Remains Plus *and* Minus Pressures.	2.28	9.29	21.02	37.41	58.38	83.91	113.89	148.25
	Then deduct Minus Pressure *of* o, Chap. V.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Remains Plus Pressure *of Head End* I	2.28	9.29	21.02	37.41	58.38	83.91	113.89	148.25

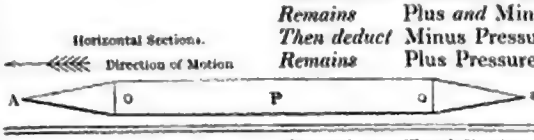
TABLE III. PART III.

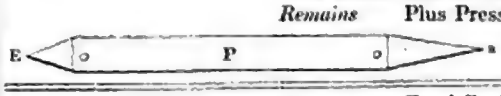
ANALYSIS of the TOTAL RESISTANCE

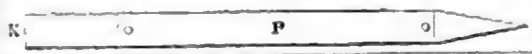
Showing at one View the MOTIVE POWER which is requisite to overcome the VARIOUS

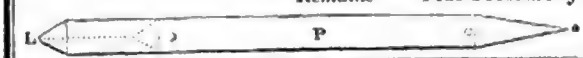
Of the BODIES used in the Year 1796.

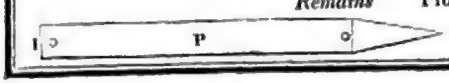
		NAUTICAL MILES per HOUR.							
		1	2	3	4	5	6	7	8
		Motive Powers in Pounds and decimal parts of Pounds.							
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
From the	Total Resistance *of* A Pa, *Table* 1.	1.42	5.02	10.46	17.62	26.41	36.74	48.56	61.83
Deduct	Friction *on Top Surface, Table* 2	0.18	0.61	1.23	2.01	2.93	4.00	5.19	6.49
Remains	Resistance *as a* Ship	1.24	4.41	9.23	15.61	23.48	32.74	43.37	55.34
Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.63	2.12	4.26	6.97	10.18	13.84	17.99	22.52
Remains	Plus *and* Minus Pressures	0.61	2.29	4.97	8.64	13.30	18.90	25.38	32.82
Then deduct	Minus Pressure *of* a *as opposite*	0.21	0.50	0.78	1.07	1.38	1.65	1.88	2.15
Remains	Plus Pressure *of Head End* A	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
From the	Total Resistance *of* E Pa, *Table* 1, ...	1.63	5.83	12.21	20.64	31.02	43.25	57.29	73.05
Deduct	Friction *on Top Surface, Table* 2	0.17	0.58	1.16	1.89	2.76	3.76	4.88	6.10
Remains	Resistance *as a* Ship	1.46	5.25	11.05	18.75	28.26	39.49	52.41	66.95
Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.58	1.94	3.90	6.38	9.33	12.71	16.48	20.63
Remains	Plus *and* Minus Pressures	0.88	3.31	7.15	12.37	18.93	26.78	35.93	46.32
Then deduct	Minus Pressure *of* a *as opposite*	0.21	0.50	0.78	1.07	1.38	1.65	1.88	2.15
Remains	Plus Pressure *of Head End* E	0.67	2.81	6.37	11.30	17.55	25.13	34.05	44.17
From the	Total Resistance *of* K Pa, *Table* 1	1.57	5.67	11.97	20.36	30.74	43.03	57.18	73.14
Deduct	Friction *on Top Surface, Table* 2	0.20	0.68	1.36	2.22	3.24	4.42	5.73	7.17
Remains	Resistance *as a* Ship	1.37	4.99	10.61	18.14	27.50	38.61	51.45	65.97
Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.61	2.04	4.11	6.71	9.81	13.37	17.33	21.70
Remains	Plus *and* Minus Pressures	0.76	2.95	6.50	11.43	17.69	25.24	34.12	44.27
Then deduct	Minus Pressure *of* a *as opposite*	0.21	0.50	0.78	1.07	1.38	1.65	1.88	2.15
Remains	Plus Pressure *of Head End* K	0.55	2.45	5.72	10.36	16.31	23.59	32.24	42.12
From the	Total Resistance *of* L Pa, *Table* 1	1.56	5.61	11.80	20.01	30.13	42.08	55.81	71.28
Deduct	Friction *on Top Surface, Table* 2	0.21	0.70	1.40	2.28	3.34	4.55	5.90	7.38
Remains	Resistance *as a* Ship	1.35	4.91	10.40	17.73	26.79	37.53	49.91	63.90
Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.62	2.09	4.19	6.85	10.01	13.64	17.69	22.14
Remains	Plus *and* Minus Pressures	0.73	2.82	6.21	10.88	16.78	23.89	32.22	41.76
Then deduct	Minus Pressure *of* a *as opposite*	0.21	0.50	0.78	1.07	1.38	1.65	1.88	2.15
Remains	Plus Pressure *of Head End* L.	0.52	2.32	5.43	9.81	15.40	22.24	30.34	39.61
From the	Total Resistance *of* I Pa *Table* 1	3.04	11.78	25.96	45.49	70.28	100.27	135.41	175.65
Deduct	Friction *on Top Surface, Table* 2	0.16	0.54	1.09	1.78	2.60	3.54	4.59	5.75
Remains	Resistance *as a* Ship	2.88	11.24	24.87	43.71	67.68	96.73	130.82	169.90
Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.53	1.77	3.55	5.81	8.49	11.57	15.00	18.77
Remains	Plus *and* Minus Pressures	2.35	9.47	21.32	37.90	59.19	85.16	115.82	151.13
Then deduct	Minus Pressure *of* a *as opposite*	0.21	0.50	0.78	1.07	1.38	1.65	1.88	2.15
Remains	Plus Pressure *of Head End* I	2.14	8.97	20.54	36.83	57.81	83.51	113.94	148.98











Digitized by Google

of the DIFFERENT BODIES *respectively;—*
RESISTANCES of the DIFFERENT BODIES as applicable to practice, and as specified below.

Of the BODIES *used in the Year* 1796.			NAUTICAL MILES per HOUR. 1	2	3	4	5	6	7	8
			Motive Powers in Pounds and decimal parts of Pounds.							
			lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs	lbs.
	From the	Total Resistance *of* A Pa, *Table* 1	1.42	5.02	10.46	17.62	26.41	36.74	48.56	61.83
	Deduct	Friction *on Top Surface, Table* 2	0.18	0.61	1.23	2.01	2.93	4.00	5.19	6.49
	Remains	Resistance *as a* Ship	1.24	4.41	9.23	15.61	23.48	32.74	43.37	55.34
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.63	2.12	4.26	6.97	10.18	13.84	17.99	22.52
	Remains	Plus *and* Minus Pressures.....	0.61	2.29	4.97	8.64	13.30	18.90	25.38	32.82
Horizontal Sections. Direction of Motion.	*Then deduct*	Plus Pressure *of* A, *Experiment* 1798..	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* a	0.21	0.50	0.78	1.07	1.38	1.65	1.88	2.15
See Body A P a opposite.										
	From the	Total Resistance *of* A Pe, *Table* 1	1.69	6.02	12.64	21.40	32.19	44.91	59.53	75.99
	Deduct	Friction *on Top Surface, Table* 2	0.17	0.58	1.16	1.89	2.76	3.76	4.88	6.10
	Remains	Resistance *as a* Ship	1.52	5.44	11.48	19.51	29.43	41.15	54.65	69.89
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.58	1.94	3.90	6.38	9.33	12.71	16.48	20.63
	Remains	Plus *and* Minus Pressures.....	0.94	3.50	7.58	13.13	20.10	28.44	38.17	49.26
	Then deduct	Plus Pressure *of* A, *Experiment* 1798 .	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* e.....	0.54	1.71	3.39	5.56	8.18	11.19	14.67	18.59
A P e										
	From the	Total Resistance *of* A Pk, *Table* 1	1.60	5.81	12.29	20.93	31.64	44.33	58.95	75.47
	Deduct	Friction *on Top Surface, Table* 2	0.20	0.68	1.36	2.22	3.24	4.42	5.73	7.17
	Remains	Resistance *as a* Ship	1.40	5.13	10.93	18.71	28.40	39.91	53.22	68.30
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.61	2.04	4.11	6.71	9.81	13.37	17.33	21.70
	Remains	Plus *and* Minus Pressures.....	0.79	3.09	6.82	12.00	18.59	26.54	35.89	46.60
	Then deduct	Plus Pressure *of* A, *Experiment* 1798 .	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* k	0.39	1.30	2.63	4.43	6.67	9.29	12.39	15.93
A P k										
	From the	Total Resistance *of* A Pl, *Table* 1	1.67	5.89	12.29	20.72	31.06	43.21	57.12	72.73
	Deduct	Friction *on Top Surface, Table* 2	0.21	0.70	1.40	2.28	3.34	4.55	5.90	7.38
	Remains	Resistance *as a* Ship	1.46	5.19	10.89	18.44	27.72	38.66	51.22	65.35
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.62	2.09	4.19	6.85	10.01	13.64	17.69	22.14
	Remains	Plus *and* Minus Pressures.....	0.84	3.10	6.70	11.59	17.71	25.02	33.53	43.21
	Then deduct	Plus Pressure *of* A, *Experiment* 1798 .	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* l.....	0.44	1.31	2.51	4.02	5.79	7.77	10.03	12.54
A P l										
	From the	Total Resistance *of* A Pi, *Table* 1	1.78	6.52	13.87	23.72	35.97	50.52	67.33	86.34
	Deduct	Friction *on Top Surface, Table* 2	0.16	0.54	1.09	1.78	2.60	3.54	4.59	5.75
	Remains	Resistance *as a* Ship	1.62	5.98	12.78	21.94	33.37	46.98	62.74	80.59
	Then deduct	Friction *on Sides and Bottom, Table* 2 .	0.53	1.77	3.55	5.81	8.49	11.57	15.00	18.77
	Remains	Plus *and* Minus Pressures.....	1.09	4.21	9.23	16.13	24.88	35.41	47.74	61.82
	Then deduct	Plus Pressure *of* A, *Experiment* 1798 .	0.40	1.79	4.19	7.57	11.92	17.25	23.50	30.67
	Remains	Minus Pressure *of Stern End* i.....	0.69	2.42	5.04	8.56	12.96	18.16	24.24	31.15
A P i										

END OF THE REPORT MADE TO THE SOCIETY.

Digitized by Google

EXPLANATION OF THE TABLES.

The Description of the Apparatus, and the Introductory Observations prefixed to the First Series and to the Report, will have acquainted the reader with the nature of the Experiments, and with the mode of calculating the results and the tables. It will only be necessary to add a few remarks upon some minor details, which though not thought worthy of notice by the author, are nevertheless necessary to be pointed out to save the reader trouble. The reader is requested to turn to page 500 of the experiments.

The table commences with stating the shape or figure of the body under trial (the dimensions are given in p. 499). The heat of the water is noticed principally for the purpose of correcting the specific gravity arising from the difference of temperature.

The depth of water in the dock determines the difference, from time to time, of the depth of water beneath the bottom of the body under trial. The wind is also noticed on account of its producing possibly some undulation in the water in the dock.

Fahrenheit's thermometer is used throughout Colonel Beaufoy's Experiments.

The Motive Weight is the Motive Power.

The chain is sometimes called No. I, in expectation that other chains might be wanted. Its length was 12 feet 6 inches; but occasionally the upper end was hung 10, 12, 14, and 15 feet above the ground, by which means the required impetus was sooner obtained. Chains Nos. II. and III. were used subsequently.

Turn to page 1 of the Experiments:

Here is given a description and representation of the body about to be tried. Then follows the Table of Motive Weights, which is a summary of the results of the experiments; as will be seen on reference to the "Velocity with the Motive Weights," in pages 2, 3, 4, 5, and 6. Then follows the Huttonian Correction, as explained in Chap. II. of the Report, p. lxxv. and shows what may be considered as the Correct or Regular Series of Experiments. Next comes the Table called "Even Feet per Second," divided into columns from 1 to 12; that is to say, from 1 foot up to 12 feet per second. The top line is the calculated Regular Series of the Motive Weights necessary to impel the body under trial through the water, with the respective velocities of 1, 2, 3, &c. feet per second. The second line is a similar series calculated from the experiments with parallelopipedon B, p. 7. By deducting the one from the other, is found the difference of resistance between the two bodies (parallelopipedons A and B) as is set down in the third line. At the bottom of the page are given the "Powers for calculating the Huttonian Correction, or Regular Series," which has been described in Chap. II. of the Report.

Page 1 is a summary of the seventeen experiments tried with parallelopipedon A, and might, perhaps, have been placed more appropriately at the end than at the beginning of the section; in truth, it was at the end in the Manuscript, but a deviation has been made so far from the Manuscript, for the sake of heading each section with a representation of the body about to be tried.

Turn to page 2. The table exhibits four experiments tried under precisely the same circumstances. The first experiment is tabulated in three columns, marked Sec. (Seconds)—Feet. In. (Inches)—Differences;—the column of

seconds is omitted in the three following experiments. In page 48, Feet Inches are abandoned for Feet and the decimal parts of a Foot, and are continued thus throughout the Work.

In the Description of the Apparatus, it has been explained how the distance passed through by the body under trial was measured, by means of a lath, a clock, and a pencil.

The column of Seconds progress in regular increments of 4 seconds each; and column 2 shows that in the first 4 seconds of time, the distance passed through by the body was 9 feet 9 inches, at the end of 8 seconds it had passed through 20 feet 9 inches, and at the end of 12 seconds 32 feet 9 inches, and so on to the end of the table. The column of differences shows the ratio in which the body varied in its velocity in each successive 4 seconds of time:—thus, in the first 4 seconds, it moved over 9 feet 9 inches—in the second 4 seconds 11 feet—in the third 4 seconds 12 feet; and so on until it had moved for 60 seconds, or through 207 feet 6 inches; at which period the body is shown to have attained its maximum, as well as an uniform velocity of 15 feet 6 inches in every 4 seconds of time to the end of the experiment, which terminates at 84 seconds, or after the body had been drawn through 300 feet 6 inches of space.

It is clear, therefore, that any gross error may be easily detected in these three columns; in the first, by observing whether the increments of distance bear a fair progressive proportion to the increments of time; the second column being the total distance run, the differences of the two first lines added together ought to make the same total as the feet and inches in the second line of the second column, the third line the same; and thus the total of the differences added together ought, if the table be correctly printed, to amount to 300 feet 6 inches. Where the totals do not agree an error must exist, which may be traced in two ways:—

First, the column of differences is found by subtracting the preceding line of feet and inches from the next below it; thus, 9 feet 9 inches deducted from 20 feet 9 inches leaves 11 feet, and 20 feet 9 inches deducted from 32 feet 9 inches leaves 12 feet, as the respective differences of the velocities of 4, 8, and 12 seconds.

In like manner, secondly, the differences will detect an error in the feet and inches: as, for instance, 9 feet 9 inches added to 11 feet amounts to 20 feet 9 inches, and 9 feet 9 inches, 11 feet, and 12 feet added together make the same amount as the third line of feet and inches, viz. 32 feet 9 inches.

Refer to page 3. Experiment 2d. line 10.—In adding 130 feet 3 inches to the succeeding difference 13 feet 3 inches, the total should be in line 11, 143 feet 6 inches, whereas in the table it stands 145 feet 6 inches, which is an error in copying 5 for 3. That the error is in the column of feet and inches, and not in the column of differences, is proved by the fact that the total column of differences added together makes the total 307 feet 3 inches.

In Experiment 3d. in the same page, line 17, an error is detected in the column of differences, viz. 13 feet 6 inches should be 13 feet 9 inches (the figure 9 having been reversed). To prove the correctness of this alteration, if the column of differences be added up, the total, if 13 feet 6 inches be left standing, will be 305 feet 6 inches, whereas the total distance run is 305 feet 9 inches; which shows that the above is a mere error in copying, and that 13 feet 6 inches must be altered to 13 feet 9 inches to make the columns prove each other. This is the way in which every table has been examined and repeatedly checked throughout the volume, which will account sufficiently for the remarks of the Publisher in the Postscript to the Preface.

The column of seconds is only attached to the first experiment on each page, to save room, or the tables could not in some instances have been compressed into the width of a page—this column, however, is intended to apply to all the other experiments in the same table. In some experiments the differences are taken at every 2, in others at 4 or 8 seconds; while in other instances, at the commencement of the experiment, the increments are taken at every 4 seconds, and then towards the middle or latter end at intervals of 2 seconds—this will be easily observed by the

reader: at the same time, cases will occur in which the seconds apply to the first experiment but do not *line* exactly for the second or third experiment: as for instance, see page 659, in which there are five experiments in one table, and yet the increments of seconds, though correctly applied to the three first experiments, are inapplicable for the fourth and fifth.

It may be as well to mention, that towards the end of the tables, in the column of differences, is placed a *, which indicates the point at which the body was considered to have commenced an uniform rate of motion. Now, as it is only upon the velocities below the star that the calculations are made, it is clear, that any mistakes above the * would not affect the accuracy of the calculated velocities as set down at the foot of each experiment and at the end of the page; errors below the * of course would.

At the bottom of the column of differences is a total (see page 2, Experiments 1, 2, 3, 4). In the first experiment the total is 123 feet 9 inches, which is the total of the number of differences below the *, viz. 8—this 123 feet 9 inches then divided by 8 gives 15 feet 5. 62 inches for the average of the 8.

Now the increments of time in the table under consideration is 4 seconds, therefore 15 feet 5. 62 inches divided by 4, gives 3 feet 10. 40 inches, as the average rate *per second* at which the body was drawn through the water in this experiment—in like manner the averages per second are found for the remaining three experiments. The total of these averages per second are then added together, and the total, 15 feet 6. 826 inches, is divided by 4, which gives 3 feet 10. 7 inches, or 3. 8925 feet as the average velocity per second, with a motive weight of 67 lbs. tried upon 4 experiments, consisting of an average of 8 in each experiment, or 32 in the whole.

In some experiments, as in page 3, where the increments of seconds is by two's, the division must be by 2, to find the rate per second.

In other experiments, as in page 84, where the increments at the beginning of the column is by four's and latterly by two's, the division must be by 2. It will be observed, that all the differences included below the * are invariably and necessarily taken at the same increments of time.

These observations, subject to occasional modifications, will make the whole familiar to the reader.

In the REPORT, instead of inserting a column of seconds quite down the page, the power of the increment is indicated thus 4), and lower down 2); the rest is understood.

The velocity *in one second* is the common measure to which all the experiments are reduced, and from which the velocities in nautical miles per hour have been calculated to suit the tables in the printed REPORT.

The Huttonian Correction, or Regular Series, as at the foot of page 1, could not be re-calculated for the reasons assigned in the Postscript to the Preface; but the totals and the divisions have been verified. One or two trifling discrepancies have been found and noted in the Table of Errata.

NOTES

ON THE APPLICATION AND CONSTRUCTION OF THE TABLES.

FIRST SERIES.

Page 19. The motive weights of parallelopipedon A (page 1) being deducted from those of E, shows the difference of resistance arising from the alteration of the two extremities of A by the addition of semi-circular ends. This remark applies to all the other bodies similiarly compared with each other.

—— 25. Line 3. The angle of incidence 3° 9′ 2″ should be 3° 8′ 48″. See Note, page 33.

—— 49. The experiments having been calculated in feet and inches for the year 1793, from the commencement of 1794 they are calculated in feet and the decimal parts of a foot, and begin at page 49.

—— 74. The surface of the bottom and two sides of parallelopipedon a is 154.32 feet, and that of b is 77.16 feet. Hence, by deducting the motive power of b (page 81) from that of a (page 74), the difference which is placed in the third line is owing to the increased friction arising from the extra 77.16 feet of surface in body a. The ends of the figures are not included in the calculation of the surface, because they are considered separately in the plus and minus pressure. In like manner, the top surface is rejected, because the body floats upon the top of the water, and of course the top surface offers no resistance to the fluid.

—— 81. For calculating the experiments made at the surface of the water, the surface of parallelopipedon b (page 81) is taken as 77.16 feet, which is just half that of parallelopipedon a (page 74), calculated in the same manner. But in calculating the experiments made beneath the surface of the water, the surface of parallelopipedon b must be taken as 102.88 feet; for at the surface of the water the friction is affected only by the bottom and two sides, but beneath the water the friction is affected by the *top*, as well as by the bottom and the sides. The ends, as already noticed, are referred to a distinct head for investigation, viz. the plus and minus pressure.

—— 87. To find the diminution of the minus pressure by the addition of the semi-ellipsis, called c, to the hindmost end of parallelopipedon b, deduct from the motive weight of b, as found in page 81, the motive weight of bc, in page 87; the result is the third line.

—— 100. The total diminution of plus and minus pressure by bodies c and b is a misprint for "by bodies c and d." This line is found by adding the diminution of plus pressure by body d (page 93) to the diminution of the minus pressure by body c (page 87). The third line, or diminution by bodies b and ebe, is found by deducting the motive weight of ebe (page 100) from the motive weight of b (page 81).

N.B. In the third line of column 12, refer to 102.24. Now, if the motive weights in pages 81 and 100 are correct, this should be 103.24; but it is probable that the error lies in one or other of the motive weights.

—— 118. Diminution by bodies b and hbh (line 2) is found by deducting the motive weights in the above experiment from the motive weights of b, in page 81. The diminution of the plus and minus pressure by bodies f and g, in the third line, is found by adding the diminution of the minus pressure by body f (see page 106) to the diminution of the plus pressure by body g (see page 112).

—— 124. The motive weights of parallelopipedon h (line 2) is the motive weight of body hbh in page 118.

Friction on 77.16 (line 3) is that of the surface of parallelopipedon b (page 81), viz. of the bottom and two sides multiplied by the length. Law of the Friction, see CHAP. VI. (page lxxxviii.) of the REPORT.

Digitized by Google

Page 134. The motive weight of b l being less than that of b (page 81), the top line must be deducted from the middle line, which gives the third line. See column 11, line 3—118.600. By deducting 95.322 (top line) from 213.930 (middle line), the remainder should be 118.608: but since 118.600 is right according to the proof in the third line of page 139, it is probable the error lies in the motive weight.

—— 139. The diminution by bodies b and m b m is found by deducting the motive weight in this experiment from the motive weight of b (page 81). The diminution of the plus and minus pressure by bodies k and l, is found by adding the diminution of the minus pressure by body k (page 129) to the diminution of the plus pressure by body l (page 134).

—— 145. The motive weights of b n (top line) being less than those of parallelopipedon b, page 81 (middle line), must be subtracted therefrom, which gives the third line as the diminution of the minus pressure by the addition of body n to parallelopipedon b.

—— 151. The same remark applies to body o

—— 155. The diminution by bodies n and o is found by deducting the motive weights of this figure (page 155) from the motive weights of parallelopipedon b (page 81).

The diminution of plus and minus pressure by bodies n and o (line 3) is found by adding the diminution of the minus pressure by body n (page 145) to the diminution of the plus pressure by body o (page 151).

—— 159. Resistance of parallelopipedon p (second line), as found in page 155, must be deducted from the motive weights (first line) page 159; this gives the third line, which is the friction on 77.16 feet of surface (see page 74 and preceding note referring to page 74). The fourth line, viz. the friction reduced to 50 feet, is found by a mere rule of proportion, viz. if 77.16 feet give 0.24852, what will 50 feet give? and thus calculate for each separate velocity.

The fifth line is brought forward from page 124.

The sixth line is found by adding the third and fifth lines together, and dividing the sum by 2 to find the mean of the friction on a surface of 77.16 feet.

—— 170. Line 3. The angle of incidence 4° 46′ 18″ should be 4° 46′ 12″. See Note, page 175.

—— 187. From the motive weights (line 1) deduct resistance of conductor and bars (page 192), which leaves the resistance and friction (line 3).

From line 3 deduct line 4, which is the friction on 102.88 feet, which is the surface of parallelopipedon b (see page 81 and note relating thereto); this leaves the amount of plus and minus pressure in line 5.

The plus and minus pressure reduced to 1 foot is found by the rule of proportion—if 1.4859 feet, the area of the end of parallelopipedon b (see page 81), gives a resistance of 1.0621, what will 1 foot give?

—— 192. The same remarks apply as to page 187.

The surface 107.27 feet is the surface of parallelopipedon b = 102.88
Added to the surface of the angular wedge k ..... = 4.39
} = 107.27 feet.

In calculating this surface, parallelopipedon b is calculated for the top, bottom, and sides; but the surface of the angular wedge is calculated for the top and bottom only; the sides are rejected because they are considered in the minus pressure.

—— 201. The same remarks apply as to page 192.

—— 209. The same remarks apply as to pages 187 and 192.

The surface 111.67 feet is found by adding the surface of parallelopipedon b = 102.88 feet
To the sum of the surfaces of the two wedges ..... = 8.79 feet
} = 111.67 feet.

Digitized by Google

Page 217. The same remarks apply to this as to the former experiment.
The surface 110. 21 is found by adding the surface of parallelopipedon b to the surfaces of the two wedges.

—— 225. The same remarks apply to this as to the former experiment.

—— 239. The friction on 50 feet in this experiment is explained by the description at the head of the figure in page 245. See also comparative experiment, 1796, in page 397.

—— 252. The motive weight for the conductor and bar will be found in page 280.

—— 258. The motive weight for the conductor and bar will be found in page 286.
The fourth line is found by the rule of proportion, by dividing the third line by 2. 9718 superficial feet.

—— 267. The motive weight for the conductor and bar will be found in page 295.

—— 300 and 312. The motive weight for the conductor and bars will be found in page 319.

SECOND SERIES.

—— 325. The correction for the various sized ropes used in the different experiments is explained in the Description of the Apparatus, page lxix. of the INTRODUCTION.

—— 334. The motive weight required for impelling the conductor with the parallelopipedon P attached is given in the first line. From this is deducted the resistance of the conductor and bars, as found by the experiments tabulated in page 325, which leaves the resistance and friction of the body under trial as set down in the third line. From this is deducted the friction against the surface of the body under trial, line 4; from which results the fifth line, viz. the plus and minus pressure of the parallelopipedon P. In the sixth line is placed the plus pressure as ascertained in 1798 (see page 514); this deducted from the plus and minus pressure leaves line 7, which is the minus pressure.

—— 342. 345. 349. and 356. Upon the same principle as the preceding.

—— 361. 371. 376. and 381. The minus pressure as ascertained in 1798 (page 514) is deducted to ascertain the plus pressure.

—— 392. The first four lines in this experiment require no comment; the fifth line gives the plus and minus pressures of parallelopipedon P (1796), the cross section of which is the same as that of I tried in 1798 (page 628). The plus pressure of 1798 (in line 6) will be found on reference to page 628. The minus pressure of 1798 (in line 7) will be found on reference to page 563. Line 8 shows the combined amount of the plus and minus pressures tried in 1798, for the purpose of comparison with 1796 in line 5. The friction on 40 feet is the area of the top, bottom, and sides of parallelopipedon I P i.

—— 397. The second line will be found in the experiment page 405. The friction on 50 feet is explained in the heading of the experiment page 405. See comparative experiments also 1796, pages 239 and 487.

—— 421. The resistance of the conductor with round iron bar will be found in page 413.

—— 425. 430. and 437. The same. For comparison of experiment with round iron plane, see page 445.

—— 445. The resistance and friction of the square plane S is found in page 437. The mean resistance, or fifth line, is found by adding together the two preceding lines and dividing the product by 2.

—— 452. The friction is on the area of the circumference of cylinder U.

—— 487. Line 1. The motive weights for new conductor, broad bar, and friction plank.
—— 2. Deduct motive weight of short friction plank, page 499.
—— 3. Is the friction on the area of the surface of the friction plank.
—— 4. Is the friction on 50 feet, found by the rule of proportion, calculated from line 3.

Page 487. Line 5. Is the friction on 50 feet, as found by experiment in 1796, page 239.

—— 6. Is the friction on 50 feet, as found by experiment in 1796, page 397.

—— 7. Is the total of these three sets of experiments added together to find the mean.

—— 8. The mean friction on 50 feet, as deduced from the foregoing three sets of experiments.

Note.—In the fourth column of table of "Feet per Second," line 3—2.572. According to the rule of proportion 2.572 is right, and it is again repeated in the GENERAL TABLE (page 688); but the short friction plank deducted from the motive weights (page 487) ought to give the same result, viz. 2.572; whereas the result is 2.582. The motive weights seem correct, because the same figures are repeated in the GENERAL TABLE (page 688), and the second line is confirmed in like manner in page 499. Thus, it is not easy to say where the discrepancy lies. Again, in the same table, column 1, line 5. By referring to pages 239 and 487—0.1925 should be 0.1924; but unless it stands in this table 0.1925, the total will be 0.5572, instead of 0.5573. Fortunately it is of no consequence, as take it either way the mean is still the same, 0.1858.

—— 509. The resistance of conductor and bar refer to page 482. The friction in these experiments is calculated upon the area of the surfaces of the several bodies as already described.

—— 526 to 563 inclusive. The plus pressure of A a, as seen in page 514, being deducted in this and the following experiments from the line of plus and minus pressures, gives the minus pressure for each body in succession.

—— 555. The two alterations made are confirmed by reference to the note appended to CHAP. XIV. of INTRODUCTION, Table 7, fig. H. In this table, the last line of column 8 (BURNEY's *Marine Dictionary*, page 401), the difference of the results by experiments is 0.731, which does not at all accord with the results that follow and precede it; but by altering the figures in that column agreeably to the TABLE OF CORRECTED READINGS (see also page 555 of *Nautical Experiments*) the result is 0.431, which accords very well.

In printing this extract from BURNEY's *Dictionary*, we have corrected no less than nine errors of the press exclusive of these alterations.

—— 569 to 603 inclusive. The minus pressure of A a, as seen in page 514, being deducted in this and the following experiments from the line of plus and minus pressures, gives the plus pressure for each body in succession.

—— 610. In line 5 of 2d table, for plus and minus pressures read plus pressure only; for the note states, that this body H o has no minus pressure.

—— 617. The plus and minus pressures of I a being found in line 5, the plus pressure is ascertained by deducting the minus pressure of A a, as found in page 514.

—— 628. I o, like H o, has no minus pressure as noted at the foot of the Table.

—— 635. The plus and minus pressures of H i having been ascertained in line 5, the plus pressure of H o, (see page 610,) if deducted, leaves line 7 for the result, which is the minus pressure of H i. (It will be observed by the note, that H o has no minus pressure.)

—— 642. The plus pressure by I o will be found in page 628.

—— 650. The plus pressure of H o will be found in page 610.

TABLE OF ERRATA AND OF CORRECTED READINGS.

Page	Column	Line*	Errors of the Press.	Presumed Errors, printed in accordance with the Manuscript. Important.	Presumed Errors, printed in accordance with the Manuscript. Trivial	Corrected Readings of the Press, and those suggested by the Publisher.
ii		1	TABLE V.			CHAP. V.
		30	cxi			cxii
xv	2	2	34			84
		13	32			92
xxxvi		2	errors in copying †			
		last but 4	cript			script
lxvii		last but 4	pencils			pencil
		last but 3	when			went
lxxxiii		last but 19	hypotheneuse			hypothenuse
lxxxvii		7	the bodies			the other bodies
xciii	1	2	PLATE III.			PART III.
c	6	4	21.07			21.05
		5	20.55			20.52
cii		last but 1	12 feet			16 feet
		last	16 feet			12 feet
3	4	11			145.6	143.6
	7	17			13.6	13.9
4	3	10	15.0			16.0
6	3	5			20.0	19.9
7	2	3	5.6548			5.6458
10	5	5			23.6	22.6
		6			23.9	22.9
		9			24.6	23.6
11	5	13	840			804
	12	14		44.2767		44.2676
18	3	3			21.6	20.6
20	7	8			187.3	167.3
	8	4			22.6	21.6
		7			23.6	23.3
24	6	4	86.9			86.0
26	5	3			27.9	27.6
	10	9		243.6		247.9
27	7	2			19.9	17.9
	9	6			18.6	19.6
32	6	6			124.0	124.3
35	5	3			26.9	24.9
37	7	2			24.6	20.6
39	7	8			15.6	15.9
50	3	15	2)25.9			4)25.9
60	2	3			111.8	101.8
67		3	10 feet 33 inches			10.33 feet
68	1	17	7.7000			6.7000
71	2	11			312.3	311.3
	5	2			25.4	25.0
75	2	8			45.4	44.10
79	3	2			6.9	5.9
80	6	5			69.3	59.3
82	2	23			61.0	61.3
	3	4			2.2	1.8

* In counting the lines begin, if the error be in the Tables, at the first line of "Seconds,"—Table of Motive Weights at "Motive Weights,"—Huttonian Correction at "Motive Weights."

† These are errors in the original Manuscript copied by Captain SCOTT.

Page	Column	Line	Errors of the Press.	Presumed Errors, printed in accordance with the Manuscript. Important.	Trivial.	Corrected Readings of the Press, and those suggested by the Publisher.
83			.3)14. 1, &c. under column of feet, should be under column of differences.			
84	5	2	.....	.....	....9.0	11.0
			Parallepipedon	.....	.....	Parallelopipedon
85	6	5	.....	.....	..59.6.....	49.6
86	7	4	.....	.....	..50.4.....	58.4
87		last but 1	.....	21)45.0142.....	.....	21)45.1142
89	2	12	.....	.....	..41.0.....	41.5
91	4	9	.....	.....	.109.7.....	100.7
		12	.....	.....	.138.9	138.8
92	10	7	...17.7	.....	.....	17.7*
96	2	3	.....	.....	..28.1.....	18.1
	5	10	....9.1.....	.....	.....	9.1*
99	2	7	.....	.....	.129.9.....	120.9
	3	8	.....	.....	..22.3.....	21.3
100			.....	By Bodies c and b	.....	By Bodies c and d
	12	3	.....	.....	.102.24.....	103.24
102	10	7	.....	.....	...5.3.....	5.4
105	3	5	.....	.....	..18.9.....	19.1
106	2	4	...3.3181.....	.....	.....	1.3181
107	7	4	.....	Two lines appear to be omitted, viz. 23.9 refers to 16 sec.; but 49.7 belongs to 28 seconds.		
111			.2)35.9, &c. under column of feet, should be under column of differences.			
112	Huttonian Correc.		.....	33.2954 is right, though the addition makes it 33.2944; the mean agrees with the former.		
117	4	5	.....	.....	..81.1.....	88.1
119	3	2	.....	.....	...4.1.....	3.8
	7	2	.....	.....	...3.5	4.5
120	3	13	.....	.....	...7.0	7.2
124	Huttonian Correc.		.....	.....	..33.2302.....	33.2372
		8	.....	M.W. parallelopipedon h	.....	M. W. body hbh
125	3	5	.....	.....	...4.9.....	4.7
126	3	5	.....	.....	...3.8.....	2.8
		18	.....	.....	...6.9.....	5.9
131	4	16	.....	.....	.103.0	100.3
135	3	7	.....	.....	...8.7	8.9
136	3	9	.....	.....	...9.6	9.1
137	3	10	.....	.....	..12.9.....	12.8
138	7	5	.....	.....	..99.9.....	89.9
139		last	..108 lbs. 8 oz.....	.....	.....	100 lbs. 8oz.
140	Thermometer		.55½°	.....	.....	53½°
			.2)11.5, &c. under column of feet, should be under column of differences.			
141	7	26	.2)12.075....	.....	.....	3)12.075
147	10	9	....	.....	...8.3	9.3
151	9	2	...39.41	.....	.....	139.41
154	3	6	.....	.....	..12.7.....	13.7
161	9	4	...13.9	.....	.....	13.0
163		3	.inclidence	.....	.....	incidence.
165	Thermometer		.60½°.....	.....	.....	60°
170		3	.....	oblique side 20.292, see note in p. 175.		
171			.3)18.2, &c. under column of feet, should be under column of differences.			
173	7	4	.....	39.1 ft. should be 29.1 feet, and thus to the end of the column, viz. 178.3 should be 168.3: or else a line has been omitted at the beginning of the table.		

Page	Column	Line	Errors of the Press.	Presumed Errors, printed in accordance with the Manuscript.		Corrected Readings of the Press, and those suggested by the Publisher.
				Important.	Trivial.	
178	10	6				
199	3	5			10.3	12.3
	8	2			13.6	13.3
		5			7.5	8.5
200	2	9			13.5	13.3
207					117.6	117.8
208	3	2	2) 13.4, &c. under column of feet, should be under column of differences.			
210	10	2			7.2	8.2
215		15	2) 24.50		8.6	6.6
218	10	9				3) 24.50
224		13	8.050		10.8	10.9
227	4	19				9.050
230	3	3		124.3		122.3
232	4	13	112.7		10.3	14.3
	3	19	3.3875			112.1
234	7	4				2.3875
236	6	11			11.0	12.0
237	3	10	13.9	135.2		136.2
242	6	5				13.8
246	2	5			32.0	42.0
	10	8			69.4	59.4
248	4	16			8.9	8.7
259	4	20		127.4		127.3
267		* Query		117.9		114.9
268	5	14		2.5543		2.5542
270	7	3			4.8	4.9
271	5	16			6.9	6.0
274		§ Query			3.5	3.6
279	9	2		2.55433		2.554165
281	5	8			9.2	8.2
282	5	2			5.4	5.6
		13			4 7	4.0
286	Huttonian Correc.				8.4	8.5
288	7	10		21.0642 is right, though the addition makes it		21.0652
290	3	2			10.2	10.4
	5	4			4.2	4.0
293	7	6			5.7	4.7
296	2	18			8.2	9.2
	3	7			61.1	91.1
304	7	10			4.1	5.1
309	6	19	3) 14.3		9.8	9.5
315	7	4	49.9			3) 14.0
319		last but 1		3) 5.0268		40.9
320	3	6				3) 6.0268
321		last	33 lbs. 3 oz.		7.1	8.1
322				t vertex foremost		33 lbs. 8 oz.
	7	4		34.114		t u vertex foremost
	14	10		308.67		36.114
325	Huttonian Correc.			28.3855 is right, though the addition makes it		308.61
328	5	6		16.07		28.3875
	6	12			143.65	16.17
	7	2			11.77	142.65
						10.77

Page	Column	Line	Errors of the Press.	Presumed Errors, printed in accordance with the Manuscript. Important.	Presumed Errors, printed in accordance with the Manuscript. Trivial.	Corrected Readings of the Press, and those suggested by the Publisher.
330	Total Weight		190 lbs.			196 lbs.
331	4	10			146.47	140.47
333	5	5			21.49	21.39
334	8	4	9.9592			9.5992
		last	1.8765			1.8705
335	4	14			100.78	101.78
	5	7			7.35	8.35
340	5	4			10.13	11.13
		11			15.21	15.31
343	3	13			6.34	6.24
	8	5			18.16	18.26
344	2	11			111.19	110.19
	7	11			13.65	13.05
	10	7			15.84	15.94
348	10	2			6.35	6.45
350	2	9			69.69	59.69
	3	4			6.53	6.63
351	2	8			65.53	66.53
353	2	4			57.69	57.65
357	7	9			8.71	8.61
358	6	9			92.93	92.33
359	4	3			52.73	32.73
	6	3			52.40	32.40
361	Hottonian Correc.			67.2822 is right, though the addition makes it		66.5712
363	7	3			8.07	8.67
364	5	4			17.46	17.56
365				22 sec. should be 24 sec.—24 should be 26—26 should be 28, &c.		
	3	6			11.86	21.86
	5	8			11.97	10.97
	6	3			13.10	37.10
366	3	7			13.41	13.31
367	6	5			42.90	42.60
375	2	4			30.57	31.57
		13			148.24	148.44
	8	10			15.71	14.71
377	3	5			11.14	12.14
378	4	3			13.02	30.02
379	4	7			64.23	62.23
	6	13		155.55		150.55
380	2	7			84.67	94.67
	3	3			12.54	13.54
	6	3			22.46	24.46
382	2	8			53.06	53.36
	6	24		162.82		162.85
384	4	3			30.52	30.32
385	3	4			18.50	18.58
	7	11			9.12	9.10
		last	August 7			August 30
386	3	7			11.16	10.66
387	6	13		121.79		131.79
388	3	3			8.34	9.34
389	2	4			45.48	35.48
390	3	7			16.63	17.63

Digitized by Google

Page	Column	Line	Errors of the Press.	Presumed Errors, printed in accordance with the Manuscript. Important.	Trivial.	Corrected Readings of the Press, and those suggested by the Publisher.
390	5	4			15.23	15.27
393	4	3			28.00	20.00
	5	10			10.65	10.35
398	2	11			83.39	84.39
	7	16		9.44		9.34
399			When these experiments			When these six experiments
400	7	7			9.11	19.11
401	5	3			7.53	9.53
402	3	2			8.32	8.42
405	2	1	2.5378.			2.5377
410	7	2			8.27	8.87
418	2	8			95.45	95.47
424	5	3			9.96	10.96
	7	5			54.37	54.57
426	3	3			8.53	18.53
427	3	2			19.27	19.20
		8			10.18	10.17
428	4	9			65.00	95.00
429	4	3			20.05	26.05
	5	5			14.32	14.33
433	7	4			8.85	8.55
		18		8.45.		8.25
				In the 1st experiment the line of increments belonging to 4 seconds is apparently omitted, 13.10 should be opposite to 6 seconds, 21.95 opposite to 8 seconds, and thus all the way down.		
435	4	6			21.65	51.65
438	Heading line		8 dwts.			8 drs.
	5	2			6.55	6.53
	9	5			8.45	8.75
443	5	2			10.20	12.20
445	12	5		155.45		155.55
446	4	10			82.82	82.80
		12			101.41	101.44
	5	4			8.14	8.54
447	3	4			13.45	13.35
448	4	9			120.24	120.54
449	3	4			8.64	8.74
450	3	9			12.19	12.09
451	2	12			169.61	159.61
	3	4			11.75	13.75
	10	4			15.29	15.39
453	3	7			9.80	9.60
	7	12			9.75	9.65
455	2	10			128.83	127.83
	6	10			131.69	131.59
456	3	2			14.95	14.85
457	9	11			12.46	12.47
460	7	3			9.72	8.72
461	3	12			7.14	7.24
463	2	1	3.1694.			3.1683
465	6	9			142.49	122.49

Digitized by Google

Page	Column	Line	Errors of the Press.	Presumed Errors, printed in accordance with the Manuscript. Important.	Presumed Errors, printed in accordance with the Manuscript. Trivial.	Corrected Readings of the Press, and those suggested by the Publisher.
467	2	14		153.55		163.55
470	5	3			19.54	19.64
473	5	7			16.09	17.09
476	7	9			8.78	8.74
477	3	10			11.20	10.80
479	9	4			14.96	14.97
480	3	6			19.25	19.35
	6	3			33.80	33.18
483	5	8			8.95	8.85
484	9	12		140.00		150.00
492	6	3			13.35	31.35
494	3	9			16.60	16.10
496	Thermometer		46°			47°
497	9	3			17.05	17.15
501	3	19	7.7183			3.7183
506			Toal Weight			Total Weight
511	2	7			129.70	122.70
512	7	5			15.45	16.45
518	9	3			9.97	9.87
523	3	7			20.60	10.60
				The increment of Seconds should run thus 24, 26, 28		
524	7	8			114.17	114.70
527	3	2			11.52	12.52
	6	15		165.29		165.19
530	4	11		156.86		166.86
533	10	7			20.40	10.40
534	3	7			13.46	13.36
537	8	6		13.356		13.056
		7		3.651		3.951
538	3	10			7.36	7.39
539	1 and 2		Chain 15.6, *in both*			15.0
543§	8	6		13.356		13.056
		7		12.218		12.518
544	5	9			13.37	13.38
548	3	7			17.82	17.92
549**	8	6		13.356		13.056
		7		7.361		7.661
550	7	8			14.07	14.08
551	7	7			19.72	9.72
553	5	4			14.05	15.05
555††	8	6		13.356		13.056
		7		4.703		5.003
557	6	3			46.49	36.49
558	4	8			74.69	74.96
	5	4			10.44	10.34
559		Query	*12.90			†12.90
561	2	4			23.97	33.97
	6	9	118.25†			118.25‡
	7	3			10.75	11.75
565	5	2			18.30	18.80
569	wood-cut		r s segment			x s segment

§ See pages 342, 514, and 532. ** See page 342. †† See pages 342 and 514; see also note.

Page	Column	Line	Errors of the Press.	Presumed Errors, printed in accordance with the Manuscript. Important.	Trivial.	Corrected Readings of the Press, and those suggested by the Publisher.
571	Heading line		Motive 24 lbs.			Motive Weight 24 lbs.
572	5	10		14.68		14.48
575	5	2			11.05	11.45
577	2	11			126.72	136.72
578	5	5			16.31	15.31
584	7	4			15.55	14.55
586	Law of plus pressure, column 1		2.1034			2.0134
592	13	4		4.55		4.50
600	Column of seconds			22, 24, 26, &c.		24, 26, 28, &c.
608	3	3			12.48	12.46
613	2	12			120.40	130.40
	5	7			60.35	62.35
620	6	15		173.62		173.02
622	10	9		133.03		143.03
	11	3			23.35	22.35
625	3	3			13.50	12.50
627	5	3			15.24	15.54
629	5	4			15.58	13.58
630	6	14		165.25		165.23
	7	2			14.00	14.10
		5			16.00	16.10
631	4	7			98.23	68.23
636	5	7			13.54	13.53
638	5	3			23.15	23.25
641	7	5			17.20	18.20
643	3	3			13.25	13.29
	5	4			12.72	11.72
644	5	6			14.75	14.77
646	7	2			7.92	6.92
		8			10.53	10.50
647	5	5			11.38	11.78
651	5	3			14.97	13.97
	8	3			19.18	20.18
654	5	6			14.18	15.18
655	5	2			6.62	7.62
656	6	8		119.59		129.59
659	2	4			57.84	51.84
660			4)37.02, &c. under column of feet, should be under column of differences.			
			36.70, &c. under column of feet, should be under column of differences.			
661	4	17			155.12	165.12
	7	5			10.90	10.10
		last			September 12	September 29
665	4	1	7.1470			7.1473
	wood-cut*					
668	3	3			7.44	7.74
		4			10.94	9.94

* This wood-cut is badly executed, as will be seen by referring to the same figure in the INDEX, PLATE XVI. The same may be said of others. In justice to the work it should be stated, that notwithstanding a celebrated artist was engaged to execute the wood-cuts, without reference to expence, upon the express condition that the blocks should be done with his own hand he, nevertheless, in consequence of illness, most mortifyingly to the Publisher, entrusted the engravings to his apprentices.

Page	Column	Line	Errors of the Press.	Presumed Errors printed in accordance with the Manuscript.		Corrected Readings of the Press, and those suggested by the Publisher.
				Important.	Trivial.	
668	5	3	.....	.....	9.29.	9.28
670	5	4	.....	.....	13.47	13.43
671	3	4	.....	.....	14.14	14.44
676	4	9	.....	.....	131.60	131.61
	7	3	.....	.....	18.00	18.42
678	7	3	.....	.....	10.51	10.50
681	Hutt. Cor.	last but 1	.....	34.2183 is right, though the addition makes it 34.2173		
682	7	3	.....	.....	13.04	13.14
683	2	10	.....	141.91	.....	141.95
	5	7	.....	.....	20.59	10.59
685	3	5	.....	.....	12.45	13.45
688	1	last but 5	.....	.....	Ih	iH
Plates III. IV. V. XV.			Published March 1, 1834.	.....	.....	Published May, 1834.
Profile and Plates I. II. VI. VII. VIII. IX. X. XI. XII. XIII. XIV. XVI.			Published March 4, 1834.	.....	.....	Published May, 1834.

The numbering of the Copies, for the List of Appropriation, has no reference whatever to RANK, PRECEDENCE, OR THE ORDER OF DISTRIBUTION.

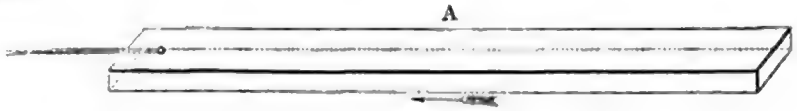
NAUTICAL

EXPERIMENTS.

THE FIRST SERIES.

Parallelopipedon A. Length 42.198 feet. Breadth 3.668 feet. Depth 1.219 feet. Area of the end 4.4713 feet.

A



	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment.....	3.8925	.....	6.9896	8.3333	9.3960	10.4000	.....
Hutt. Correction, or Regular Series	3.8461	5.1799	6.9765	8.3038	9.3960	10.3400	111.84

	Even Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights...	2.9050	14.620	37.574	73.406	123.40	188.66	270.11	368.59	484.88	619.83	773.54	947.23
Motive Weights of Parall. B..	2.2966	11.743	30.502	60.045	101.53	155.96	224.19	307.00	405.08	519.13	649.72	797.42
Difference of Resistance.....	0.6084	2.877	7.072	13.361	21.87	32.70	45.92	61.59	79.80	100.70	123.82	149.81

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
67 and	268	2.3683							
	402	2.3538	268 .. 402	2.3059					
	536	2.3597	536	2.3428	402 .. 536	2.3969			
	670	2.3430	670	2.3058	670	2.3057	536 .. 670	2.1980	
								10)23.2799	
							Mean 268 and 536.	2.3280	

FRIDAY, October 11, 1793.

Parallelopipedon A.

Total Weight 755 lbs. Motive Weight 67 lbs. Small Blocks.

Accelerating Wt. none.				Accel. Wt. none.			Accel. Wt. none.			Accel. Wt. none.		
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.	Feet.	In.	Differences.	Feet.	In.	Differences.
4	9	9	9 9	9	6	9 6	9	9	9 9	9	9	9 9
8	20	9	11 0	20	6	11 0	20	9	11 0	20	9	11 0
12	32	9	12 0	32	9	12 3	32	9	12 0	32	9	12 0
16	45	6	12 9	45	6	12 9	45	6	12 9	45	9	13 0
20	58	9	13 3	58	9	13 3	58	9	13 3	59	0	13 3
24	72	6	13 9	72	6	13 9	72	9	14 0	73	0	14 0
28	86	9	14 3	86	9	14 3	86	9	14 0	87	3	14 3
32	101	3	14 6	101	0	14 3	101	3	14 6	101	6	14 3
36	116	0	14 9	115	9	14 9	115	9	14 6	116	3	14 9
40	131	0	15 0	130	6	14 9	130	9	15 0	131	3	15 0
44	146	0	15 0	145	3	14 9	145	9	15 0	146	3	15 0
48	161	3	15 3	160	6	15 3	161	0	15 3	161	6	15 3
52	176	9	15 6	175	9	15 3	176	3	15 3	177	0	15 6
56	192	0	15 3*	191	0	15 3*	191	9	15 6*	192	6	15 6*
60	207	6	15 6	206	0	15 0	207	3	15 6	208	0	15 6
64	223	0	15 6	221	6	15 6	223	0	15 9	223	6	15 6
68	238	6	15 6	236	9	15 3	238	9	15 9	239	6	16 0
72	254	0	15 6	252	0	15 3	254	9	16 0	255	3	15 9
76	269	6	15 6	267	3	15 3	270	9	16 0	271	3	16 0
80	285	0	15 6	282	9	15 6	286	9	16 0	287	0	15 9
84	300	6	15 6	298	3	15 6	302	6	15 9	302	9	15 9
			8) 123 9			122 6			126 3			125 9
			4) 15 5.62			15 3.75			15 9.375			15 8.625
			3 10.40			3 9.93			3 11.34			3 11.156
						3 10.40						
						3 11.34						
						3 11.156						
						4) 15 6.826						

Velocity with a Motive Weight of 67 lbs... 3 10.7 or 3.8925

SATURDAY, October 12, 1793.

Parallelopipedon A.

Total Weight 3308 lbs. Motive Weight 268 lbs.

Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	10	6	10 6	10	0	10	0	9	9	9	9
4	22	9	12 3	22	3	12	3	21	9	12	0
6	36	6	13 9	36	0	13	9	35	3	13	6
8	50	6	14 0	50	0	14	0	49	3	14	0
10	64	3	13 9	64	0	14	0	63	0	13	9
12	77	6	13 3	77	9	13	9	76	9	13	9
14	90	9	13 3	90	9	13	0	90	3	13	6
16	103	9	13 0	104	0	13	3	103	3	13	0
18	116	9	13 0	117	3	13	3	116	3	13	0
20	129	9	13 0	130	3	13	0	129	6	13	3
22	142	9	13 0	145	6	13	3	142	6	13	0
24	155	9	13 0	156	6	13	0	155	6	13	0
26	169	0	13 3	169	9	13	3	168	9	13	3
28	182	3	13 3	183	3	13	6	182	3	13	6
30	195	6	13 3	196	6	13	3	195	6	13	3
32	209	0	13 6	209	9	13	3	209	0	13	6
34	222	6	13 6	223	6	13	9	222	9	13	6
36	236	3	13 9	237	3	13	9	236	3	13	6
38	250	0	13 9	251	0	13	9	250	0	13	9
40	263	9	13 9*	264	9	13	9*	264	0	14	0*
42	277	6	13 9	279	0	14	3	278	0	14	0
44	291	9	14 3	293	0	14	0	291	9	13	9
46	305	9	14 0	307	3	14	3	305	9	14	0
			4)55 9			56	3			55	9
			2)13 11.25			14	0.75			13	11.25
			6 11.625			7	0.375			6	11.625
						6	11.625				
						6	11.625				
						20	11.625				

Velocity with a Motive Weight of 268 lbs. . . . 6 11.875 or 6.9896

SATURDAY, October 12, 1793.

Parallelopipedon A.

Total Weight 4631 lbs. Motive Weight 402 lbs.

Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	13	3	13 3	11	9	11 9		12	0	12 0	
4	28	9	15 6	26	9	15 0		27	3	15 3	
6	44	9	16 0	43	3	16 6		43	9	16 6	
8	61	3	16 6	59	9	16 6		60	0	16 3	
10	77	3	16 0	75	9	16 0		76	0	16 0	
12	93	3	16 0	91	9	16 0		92	0	16 0	
14	109	0	15 9	107	6	15 9		107	9	15 9	
16	125	0	16 0	123	6	16 0		123	9	16 0	
18	140	9	15 9	139	6	16 0		140	0	16 3	
20	156	9	15 0	155	6	16 0		156	0	16 0	
22	172	9	16 0	171	6	16 0		172	3	16 3	
24	189	0	16 3	187	9	16 3		188	6	16 3	
26	205	0	16 0	204	0	16 3		205	0	16 6	
28	221	6	16 6*	220	6	16 6*		221	6	16 6*	
30	238	0	16 6	237	0	16 6		238	3	16 9	
32	254	3	16 3	253	9	16 9		255	0	16 9	
34	270	9	16 6	270	3	16 6		271	9	16 9	
36	287	6	16 9	287	3	17 0		288	9	17 0	
38	304	3	16 9	304	0	16 9		305	9	17 0	
			6)99 3			100 0				100 9	
			2)16 6.5			16 8				16 9.5	
			8 3.25			8 4				8 4.75	
						8 3.25					
						8 4.75					
						3)25 0.00					

Velocity with a Motive Weight of 402 lbs. . . 8 4.00 or 8.3333

SATURDAY, October 12, 1793.

Parallelopipedon A.

Total Weight 6062 lbs. Motive Weight 536 lbs.

Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	14	6	14 6	15	0	15 0		14	0	14 0	
4	32	0	17 6	32	9	17 9		31	0	17 0	
6	50	0	18 0	51	0	18 3		49	3	18 3	
8	68	3	18 3	69	3	18 3		67	6	18 3	
10	86	3	18 0	87	6	18 3		85	6	18 0	
12	104	6	18 3	105	9	18 3		103	6	18 0	
14	122	9	18 3	124	6	18 9		122	0	18 6	
16	141	0	18 3	143	0	18 6		140	3	18 3	
18	159	6	18 6	161	9	18 9		158	9	18 6	
20	177	9	18 3	180	6	18 9		177	0	18 3	
22	196	3	18 6	199	3	18 9		195	9	18 9	
24	214	9	18 6*	218	0	18 9*		214	3	18 6*	
26	233	3	18 6	237	0	19 0		233	0	18 9	
28	251	9	18 6	256	0	19 0		251	9	18 9	
30	270	6	18 9	275	0	19 0		270	6	18 9	
32	289	3	18 9	294	0	19 0		289	6	19 0	
34	308	0	18 9	313	0	19 0		308	6	19 0	
			6)111 9			113 9				112 9	
			2)18 7.5			18 11.5				18 9.5	
			9 3.75			9 5.75				9 4.75	
						9 3.75					
						9 4.75					
						3)28 2.25					

Velocity with a Motive Weight of 536 lbs.. 9 4.75 or 9.396

MONDAY, October 14, 1793.

Parallelopipedon A.

Total Weight 7480¼ lbs. Motive Weight 670 lbs.

Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	16	6	16 6	15	6	15 6		16	0	16 0	
4	35	9	19 3	33	9	18 3		34	6	18 6	
6	55	6	19 9	53	9	20 0		54	6	20 0	
8	75	3	19 9	73	0	19 3		73	9	19 3	
10	95	0	20 0	93	0	20 0		93	6	19 9	
12	115	3	20 3	113	0	20 0		113	6	20 0	
14	135	6	20 3	133	0	20 0		133	9	20 3	
16	156	0	20 6	153	6	20 6		154	3	20 6	
18	176	6	20 6	174	0	20 6		174	9	20 6	
20	197	0	20 6	194	6	20 6		195	3	20 6	
22	217	6	20 6*	215	3	20 9*		216	0	20 9*	
24	238	3	20 9	236	0	20 9		236	6	20 6	
26	259	0	20 9	257	0	21 0		257	6	21 0	
28	279	9	20 9	277	9	20 9		278	3	20 9	
30	300	9	21 0	298	9	21 0		299	3	21 0	
			5)103 9			104 3				104 0	
			2)20 9			20 10.2				20 9.6	
			10 4.5†			10 5.1				10 4.8	
						10 4.5					
						10 4.8					
						3)31 2.4					

Velocity with a Motive Wt. of 670 lbs. 10 4.8 or 10.400

† The first experiment was made on Saturday, Oct. 12, 1793.

SATURDAY, October 12, 1793.

Parallelopipedon A.

T. W. 4257. M. W. 368.

Accel. Wt. large ball.			
Sec.	Feet.	In.	Differences.
2	12	6	12 6
4	27	0	14 6
6	42	9	15 9
8	58	3	15 6
10	73	9	15 6
12	89	0	15 3
14	104	0	15 0
16	118	9	14 9
18	134	0	15 3
20	149	0	15 0
22	164	3	15 3
24	179	9	15 6
26	195	0	15 3
28	210	6	15 6
30	226	6	16 0
32	242	0	15 6
34	258	0	16 0*
36	274	0	16 0
38	290	0	16 0
40	306	0	16 0
			16 0

Velocity with a M. Wt. of 368 lbs. . . 8 0

Parallelopipedon B. Length 21.099 feet. Breadth 3.668 feet. Depth 1.219 feet. Area of the end 4.4713 feet.

B

	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment	.....	5.6548	.....	8.7875	.....	.....	12.042
Hutt. Correction, or Regular Series	4.1907	5.6254	7.5514	8.9707	10.137	11.404	12.042

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	2.2966	11.743	30.502	60.045	101.53	155.96	224.19	307.00	405.08	519.13	649.72	797.42

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.			
134 and	402	2.4921		
	804	2.3704	402..804	2.2000

3)7.0625

Mean.. 2.3542 = 134 and 804.

SATURDAY, October 26, 1793.

Parallelopipedon B.

Total Weight 1594 lbs.	Motive Weight 134 lbs.	Small Blocks.

Accelerating Wt. none.			Accel. Wt. none.			Accel. Wt. none.		
Sec.	Feet. In.	Differences.	Feet. In.	Differences.		Feet. In.	Differences.	
4	14 3	14 3	14 6	14 6		17 9	17 9	
8	33 0	18 9	34 0	19 6		37 6	19 9	
12	53 6	20 6	54 6	20 6		58 6	21 0	
16	74 9	21 3	76 0	21 6		80 0	21 6	
20	96 3	21 6	97 6	21 6		101 9	21 9	
24	117 9	21 6	119 6	22 0		123 6	21 9	
28	139 9	22 0	141 6	22 0		145 3	21 9	
32	161 9	22 0	163 9	22 3		167 3	22 0	
36	183 9	22 0	186 0	22 3		189 3	22 0	
40	206 0	22 3	208 9	22 9		211 3	22 0	
44	228 3	22 3	231 6	22 9		233 6	22 3	
48	250 0	21 9	254 3	22 9		256 0	22 6	
52	272 0	22 0*	277 0	22 9*		279 0	23 0*	
56	294 0	22 0	299 9	22 9		302 0	23 0	
60	316 3	22 3	322 6	22 9		324 9	22 9	
		3)66 3		68 3			68 9	
		4)22 1		22 9			22 11	
		5 6.25		5 8.25			5 8.75	
				5 6.25				
				5 8.75				
				3)16 11.25				

Velocity with a Motive Weight of 134 lbs.. 5 7.75 or 5.6458

THURSDAY, October 24, 1793.*

Parallelopipedon B.

Total Weight 4678 lbs. Motive Weight 402 lbs.

Accel. Wt. both balls.					A. Wt. both balls.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	15	9	15	9	16	6	16	6
4	32	9	17	0	33	6	17	0
6	50	9	18	0	51	6	18	0
8	68	6	17	9	69	3	17	9
10	85	9	17	3	86	3	17	0
12	102	3	16	6	102	9	16	6
14	118	6	16	3	119	3	16	6
16	135	3	16	9	135	9	16	6
18	151	9	16	6	152	3	16	6
20	168	6	16	9	169	3	17	0
22	185	6	17	0	186	3	17	0
24	202	6	17	0	203	3	17	0
26	219	6	17	0	220	6	17	3
28	237	0	17	6*	238	0	17	6*
30	254	6	17	6	255	6	17	6
32	272	0	17	6	273	0	17	6
34	289	6	17	6	290	6	17	6
36	307	3	17	9	308	6	18	0
			87	9			88	0
			17	6.6			17	7.2
			8	9.3			8	9.6
							8	9.3
							17	6.9
Velocity with a Motive Weight of 402 lbs. .							8	9.45 or 8.7875

* The reader will perceive that the experiments do not follow in the order of time, but according to the increase of weights.—Ed.

Digitized by Google

FRIDAY, October 25, 1793.

Parallelopipedon B.

Total Weight 9022¼ lbs. Motive Weight 804 lbs.

Accelerating Wt. none.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	17	6	17 6	18	6	18 6		20	0	20	0
4	37	6	20 0	38	9	20 3		40	9	20	9
6	59	0	21 6	60	6	21 9		62	9	22	0
8	81	3	22 3	82	9	22 3		85	3	22	6
10	103	9	22 6	105	3	23 6		107	9	22	6
12	126	6	22 9	128	0	23 9		131	0	23	3
14	149	6	23 0	151	0	23 0		154	3	23	3
16	172	6	23 0	174	6	23 6		177	6	23	3
18	196	0	23 6	198	0	24 6		201	0	23	6
20	219	6	23 6	221	9	23 9		225	0	24	0
22	243	3	23 9	245	9	24 0		249	3	24	3
24	267	3	24 0*	270	0	24 3*		273	6	24	3*
26	291	3	24 0	293	9	23 9		297	6	24	0
28	315	3	24 0	318	0	24 3		321	9	24	3
			3)72 0			72 3				72	6
			2)24 0			24 1				24	2
			12 0			12 0.5				12	1
						12 0.0					
						12 1.0					
						3)36 1.5					

Velocity with a Motive Weight of 804 lbs.. 12 0.5 or 12.042

Parallelopipedon A on its edge, called C. Length 42.198 feet. Breadth 3.668 feet. Depth 1.219 feet. Area of the end 4.4713 feet.

C

	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment	3.3310	4.7660	6.5290	8.0210	9.1660	10.016	11.079
Hutt. Correction, or Regular Series	3.4284	4.7631	6.6175	8.0210	9.1938	10.220	11.144

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	4.9900	21.512	50.568	92.737	148.44	218.00	301.71	399.78	512.46	639.96	782.25	939.74

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.																	
67 and	134	1.9349																
	268	2.0600	134 ..	268	2.2023													
	402	2.0389		402	2.1105	268 ..	402	1.9701										
	536	2.0543		536	2.1197		536	2.0432	402 ..	536	2.1559							
	670	2.0915		670	2.1671		670	2.1412		670	2.2998	536 ..	670	2.5162				
	804	2.0677		804	2.1241		840	2.0776		804	2.1461		804	2.1390	670 ..	804	1.8075	
																21)	44.2767	
														Mean 134 and 402			2.1080	

WEDNESDAY, September 25, 1793.

Parallelopipedon A on its edge, called C.

Total Weight 765 lbs.			Motive Weight 67 lbs.			Small Blocks.		
Accelerating Wt. none.			Accel. Wt. none.			Accel. Wt. none.		
Sec.	Feet. In.	Differences.	Feet. In.	Differences.		Feet. In.	Differences.	
8	17 6	17 6	20 0	20 0		17 0	17 0	
16	38 3	20 9	42 3	22 3		37 9	20 9	
24	61 3	23 0	66 3	24 0		60 3	22 6	
32	85 3	24 0	91 0	24 9		84 3	24 0	
40	110 0	24 9	116 6	25 6		109 3	25 0	
48	135 6	25 6	142 0	25 6		135 0	25 9	
56	161 3	25 9	168 0	26 0		161 0	26 0	
64	187 3	26 0	194 6	26 6		187 3	26 3	
72	213 6	26 3*	220 6	26 0*		214 3	27 0*	
80	240 0	26 6	247 6	27 0		241 0	26 9	
88	267 0	27 0	273 6	26 0		267 9	26 9	
96	293 9	26 9	300 3	26 9		295 0	27 3	
104	320 0	26 3	326 9	26 6		322 0	27 0	
		5)132 9		132 3			134 9	
		8)26 6.6		26 5.4			26 11.4	
		3 3.825		3 3.675			3 4.425	
				3 3.825				
				3 4.425				
				3)9 11.925				

Velocity with a Motive Weight of 67 lbs.. 3 3.975 or 3.331

WEDNESDAY, September 25, 1793.

Parallelopipedon A on its edge, called C.

Total Weight 1453 lbs.			Motive Weight 134 lbs.			Small Blocks.		
Accelerating Wt. none.			Accel. Wt. none.			Accel. Wt. none.		
Sec.	Feet. In.	Differences.	Feet. In.	Differences.		Feet. In.	Differences.	
4	11 6	11 6	11 0	11 0		11 6	11 6	
8	25 6	14 0	24 0	13 0		26 0	14 6	
12	41 0	15 6	39 3	15 3		41 3	15 3	
16	57 3	16 3	55 3	16 0		57 6	16 3	
20	74 3	17 0	72 6	17 3		74 6	17 0	
24	92 0	17 9	89 9	17 3		92 3	17 9	
28	109 9	17 9	107 3	17 6		109 9	17 6	
32	128 0	18 3	125 6	18 3		127 6	17 9	
36	146 0	18 0	144 0	18 6		145 6	18 0	
40	164 9	18 9	162 6	18 6		164 6	19 0	
44	183 6	18 9	181 6	19 0		183 6	19 0	
48	202 0	18 6	200 3	18 9		202 3	18 9	
52	221 0	19 0*	219 6	19 3*		221 6	19 3*	
56	239 9	18 9	238 6	19 0		240 6	19 0	
60	258 9	19 0	257 9	19 3		259 6	19 0	
64	277 6	18 9	277 0	19 3		278 6	19 0	
68	296 6	19 0	296 6	19 6		297 6	19 0	
		5)94 6		96 3			95 3	
		4)18 10.8		19 3			19 0.6	
		4 8.7		4 9.75			4 9.15	
				4 8.70				
				4 9.15				
				3)14 3.60				

Velocity with a Motive Weight of 134 lbs.. 4 9.20 or 4.766

TUESDAY, September 24, 1793.

Parallelopipedon A on its edge, called C.

Total Weight 3376 lbs. Motive Weight 268 lbs.

Accel. Wt. small ball.				A. Wt. small ball.				A. Wt. small ball.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
4	20	6	20 6	17	6	17 6		17	6	17 6	
8	42	6	22 0	38	6	21 0		38	3	20 9	
12	65	0	22 6	60	9	22 3		60	6	22 3	
16	88	6	23 6	83	3	22 6		83	9	23 3	
20	112	3	23 9	107	3	24 0		107	0	23 3	
24	137	0	24 9	131	6	24 3		131	3	24 3	
28	161	3	24 3	156	0	24 6		155	9	24 6	
32	186	6	25 3	181	0	25 0		181	0	25 3	
36	212	0	25 6	206	9	25 9		206	6	25 6	
40	237	9	25 9*	232	9	26 0*		232	6	26 0*	
44	263	6	25 9	258	9	26 0		258	6	26 0	
48	289	3	25 9	285	3	26 6		284	9	26 3	
52	315	3	26 0	312	0	26 9		311	6	26 9	
56	340	3	25 0	339	0	27 0		.....		.....	
			5)128 3			132 3				4)105 0	
			4)25 7.8			26 5.4				26 3	
			6 4.95			6 7.35				6 6.75	
						6 4.95					
						6 6.75					
						3)19 7.05					

Velocity with a Motive Weight of 268 lbs.... 6 6.35 or 6.529

SATURDAY, September 21, 1793.

Parallelopipedon A on its edge, called C.

Total Weight 4885¼ lbs. Motive Weight 402 lbs.

Accel. Wt. large ball.					A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
4	26	0	26	0	25	9	25	9	25	3	25	3
8	56	9	30	9	56	9	31	0	56	6	31	3
12	87	0	30	3	87	6	30	9	87	3	30	9
16	116	9	29	9	117	9	30	3	117	3	30	0
20	147	0	30	3	148	3	30	6	147	9	30	6
24	177	6	30	6	179	3	31	0	178	6	30	9
28	208	9	31	3	210	9	31	6	210	0	31	6
32	240	3	31	6	242	9	32	0	241	6	31	6
36	272	0	31	9	274	6	31	9	273	6	32	0
40	304	0	32	0*	306	6	32	0*	305	9	32	3*
			4)32	0			32	0			32	3
			8	0			8	0			8	0.75
							8	0				
							8	0.75				
							3)24	0.75				

Velocity with a Motive Weight of 402 lbs.... 8 0.25 or 8.021

SATURDAY, September 21, 1793.

Parallelopipedon A on its edge, called C.

Total Weight 6317 lbs. Motive Weight 536 lbs.												
Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.				
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	14	3	14	3	14	6	14	6	15	3	15	3
4	31	0	16	9	30	9	16	3	32	9	17	6
6	48	9	17	9	48	6	17	9	50	0	17	3
8	66	0	17	3	66	6	18	0	67	3	17	3
10	82	9	16	9	83	9	17	3	84	9	17	6
12	100	0	17	3	101	0	17	3	102	0	17	3
14	117	6	17	6	118	3	17	3	119	6	17	6
16	134	9	17	3	136	0	17	9	136	9	17	3
18	152	6	17	9	153	9	17	9	154	3	17	6
20	170	3	17	9	171	6	17	9	172	3	18	0
22	188	3	18	0	189	6	18	0	190	0	17	9
24	206	6	18	3	207	9	18	3	208	0	18	0
26	224	6	18	0*	226	0	18	3*	226	3	18	3*
28	243	0	18	6	244	3	18	3	244	6	18	3
30	261	9	18	9	263	0	18	9	262	9	18	3
32	279	9	18	0	281	3	18	3	281	3	18	6
34	298	6	18	9	299	9	18	6	299	3	18	0
36	316	9	18	3	318	6	18	9	317	0	17	9
			6) 110	3			110	9			109	0
			2) 18	4.5			18	5.5			18	2
			9	2.25			9	2.75			9	1
							9	2.25				
							9	1.00				
							3) 27	6.00				
Velocity with a Motive Weight of 536 lbs. .							9	2.00 or 9.166				

SATURDAY, September 21, 1793.

Parallelopipedon A on its edge, called C.

Total Weight 7720 lbs. Motive Weight 670 lbs.												
Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.				
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	16	0	16	0	15	6	15	6	17	3	17	3
4	35	0	19	0	34	3	18	9	36	3	19	0
6	54	0	19	0	53	3	19	0	55	6	19	3
8	72	9	18	9	72	9	19	6	74	6	19	0
10	92	3	19	6	91	6	18	9	93	6	19	0
12	111	0	18	9	110	9	19	3	112	9	19	3
14	130	0	19	0	130	0	19	3	132	0	19	3
16	149	3	19	3	149	3	19	3	151	9	19	9
18	168	9	19	6	169	0	19	9	171	3	19	6
20	188	6	19	9	188	6	19	6	191	3	20	0
22	208	6	20	0	208	3	19	9	211	3	20	0
24	228	6	20	0*	228	6	20	3*	231	3	20	0*
26	248	3	19	9	248	3	19	9	251	3	20	0
28	268	3	20	0	268	6	20	3	271	0	19	9
30	288	0	19	9	288	9	20	3	291	3	20	3
32	308	3	20	3	308	9	20	0	311	6	20	3
			5)99	9			100	6			100	3
			2)19	11.4			20	1.2			20	0.6
			9	11.7			10	0.6			10	0.3
							9	11.7				
							10	0.3				
							3)30	0.6				
Velocity with a Motive Weight of 670 lbs..							10	0.2 or 10.016				

Digitized by Google

SATURDAY, September 21, 1793.

Parallelopipedon A on its edge, called C.

Total Weight 9223¼ lbs. Motive Weight 804 lbs.

Accel. Wt. large ball.					A. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	21	0	21	0	18	6	18	6	16	9	16	9	16	3	16	3
4	41	6	20	6	39	3	20	9	36	9	20	0	33	6	17	3
6	62	0	21	6	60	6	21	3	57	9	21	0	54	0	20	6
8	83	0	21	0	80	9	20	3	79	0	21	3	75	0	21	0
10	104	0	21	0	101	3	20	6	99	9	20	9	96	0	21	0
12	124	9	20	9	122	0	20	9	121	3	21	6	117	0	21	0
14	146	3	21	6	143	3	21	3	142	3	21	0	138	3	21	3
16	167	9	21	6	164	6	21	3	163	9	21	6	159	6	21	3
18	189	3	21	6	185	9	21	3	185	3	21	6	181	0	21	6
20	211	3	22	0	207	3	21	6	207	3	22	0	202	9	21	9
22	233	0	21	9*	229	0	21	9*	229	9	22	6*	224	9	22	0*
24	255	3	22	3	250	0	21	0	252	0	22	3	247	0	22	3
26	277	3	22	0	272	9	22	9	274	6	22	6	269	9	22	9
28	299	0	21	9	295	0	22	3	296	6	22	0	291	3	21	6
30	.....		.....		317	3	22	3	319	3	22	9	314	3	23	0
			4)87	9			5)110	0			112	0			111	6
			2)21	11.25			22	0			22	4.8			22	3.6
			10	11.62			11	0			11	2.4			11	1.8 †
							10	11.62								
							11	2.40								
							11	1.80								
							4)44	3.82								

Velocity with a Motive Weight of 804 lbs. . 11 0.95 or 11.079

† The fourth experiment was made on Wednesday, September 18, 1793.

Parallelopipedon A lengthened by adding a semicircular end to each extremity, called E.

A, with semi-cylinder fore and after bodies.

	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment.....	4.6796	6.0875	7.7604	9.4097	10.734	11.833	.....
Hutt. Correction, or Regular Series	4.5679	6.0835	8.1018	9.5805	10.790	11.833	12.760

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	1.6988	9.0860	24.230	48.595	83.377	129.60	188.18	259.93	345.59	445.95	561.54	693.10
Motive Weights of Parall. A..	2.9050	14.6200	37.574	73.406	123.400	188.66	270.11	368.59	484.88	619.83	773.54	947.23
Difference of Resistance	1.2062	5.5340	13.344	24.811	40.023	59.06	81.93	108.66	139.29	173.88	212.00	254.13

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.													
67 and	134	2.6353												
	268	2.7407	134 ..	268	2.8550									
	402	2.5650		402	2.5226	268 ..	402	2.1041						
	536	2.5048		536	2.4442		536	2.1368	402 ..	536	2.1848			
	670	2.4821		670	2.4214		670	2.1720		670	2.2292	536 ..	670	2.2892

15)36.2872

Mean 134 and 670 2.4191

MONDAY, September 30, 1793.

Parallelopipedon A lengthened by adding a semicircular end to each extremity, called E.

Total W. 792 lbs. M. W. 67 lbs. Small Blocks.

Accelerating Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.
8	23	0	23 0	22	9	22 9
16	51	0	28 0	50	9	28 0
24	82	6	31 6	82	3	31 6
32	116	3	33 9	115	9	33 6
40	151	3	35 0	150	6	34 9
48	187	6	36 3	186	3	35 9
56	224	3	36 9	222	9	36 6
64	261	9	37 6*	259	9	37 0*
72	299	6	37 9	297	3	37 6
			2)75 3			74 6
			8)37 7.5			37 3
			4 8.4			4 7.875
						4 8.440
						2)9 4.315
Velocity with a Motive Wt. of 67 lbs. .						4 8.156 or 4.6796

Total Weight 1474 lbs. Motive Weight 134 lbs.

Accelerating Wt. none.				Accel. Wt. none.			Accel. Wt. none.		
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.	Feet.	In.	Differences.
4	15	6	15 6	15	6	15 6	14	0	14 0
8	32	6	17 0	33	6	18 0	31	9	17 9
12	53	6	21 0	53	0	19 6	51	6	19 9
16	75	0	22 6	74	3	21 3	72	6	21 0
20	97	3	22 3	96	3	22 0	94	6	22 0
24	120	3	23 0	119	3	23 0	117	0	22 6
28	143	6	23 6	142	9	23 6	140	3	23 3
32	187	3	23 9	166	6	23 9	163	9	23 6
36	191	3	24 0	190	9	24 3	187	9	24 0
40	215	6	24 3*	215	0	24 3*	211	9	24 0*
44	239	9	24 3	239	6	24 6	236	0	24 3
48	264	0	24 3	264	0	24 6	260	6	24 6
52	288	3	24 3	288	9	24 9	285	0	24 6
56	312	6	24 3	313	0	24 3	309	6	24 6
			5)121 3			122 3			121 9
			4)24 3			24 5.4			24 4.2
			6 0.75			6 1.35			6 1.05
						6 0.75			
						6 1.05			
						3)18 3.15			
						Velocity with a Motive Weight of 134 lbs. . 6 1.05 or 6.0875			

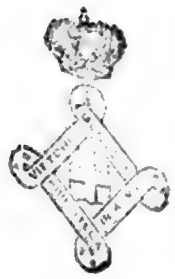
SATURDAY, October 5, 1793.

Parallelopipedon A lengthened, called E.

Total Weight 3251½ lbs. Motive Weight 268 lbs.

Accel. Wt. large ball.					A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
4	28	0	28	0	26	9	26	9	28	3	28	3
8	59	3	31	3	57	9	31	0	59	3	31	0
12	89	3	30	0	88	0	30	3	89	6	30	3
16	118	9	29	6	117	6	29	6	119	0	29	6
20	148	3	29	6	147	0	29	6	148	6	29	6
24	178	0	29	9	176	9	29	9	178	3	29	9
28	208	0	30	0	206	6	29	9	208	3	30	0
32	238	6	30	6	236	9	30	3	238	9	30	6
36	269	6	31	0*	267	3	30	6*	269	6	30	9*
40	301	3	31	9	298	3	31	0	300	9	31	3
			2)62	9			61	6			62	0
			4)31	4.5			30	9			31	0
			7	10.125			7	8.250			7	9
							7	10.125				
							7	9.000				
							3)23	3.375				

Velocity with a Motive Weight of 268 lbs. . 7 9.125 or 7.7604



FRIDAY, October 4, 1793.

Parallelopipedon A lengthened, called E.

Total Weight 4683½ lbs. Motive Weight 402 lbs.												
Accelerating Wt. none.				A. Wt. large ball.				A. Wt. large ball.				
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	10	0	10	0	10	9	10	9	13	9	13	9
4	21	6	11	6	24	9	14	0	30	0	16	3
6	35	0	13	6	41	3	16	6	47	9	17	9
8	49	6	14	6	58	9	17	6	65	6	17	9
10	65	0	15	6	76	9	18	0	83	6	18	0
12	81	0	16	0	94	9	18	0	101	0	17	6
14	97	6	16	6	112	9	18	0	118	6	17	6
16	114	6	17	0	130	3	17	6	136	3	17	9
18	131	6	17	0	148	0	17	9	154	0	17	9
20	148	6	17	0	166	0	18	0	172	3	18	3
22	166	0	17	6	184	3	18	3	190	0	17	9
24	183	6	17	6	202	9	18	6	208	3	18	3
26	201	3	17	9	221	3	18	6	226	6	18	3
28	219	6	18	3	240	0	18	9	245	0	18	6
30	237	6	18	0	258	0	18	0	263	3	18	3
32	256	0	18	6*	277	6	19	6*	281	9	18	6*
34	274	6	18	6	296	6	19	0	300	3	18	6
36	293	0	18	6	315	6	19	0	319	3	19	0
38	312	0	19	0	.....		.....		.....		.....	
			4)74	6			3)57	6			56	0
			2)18	7.5			19	2.0			18	8
			9	3.75			9	7.0			9	4
							9	3.75				
							9	4.0				
							3)28	2.75				

Velocity with a Motive Weight of 402 lbs.. 9 4.9166 or 9.4097

FRIDAY, October 4, 1793.

Parallelopipedon A lengthened, called E.

Total Weight 6156½ lbs.					Motive Wt. 536 lbs.			
Accel. Wt. large ball.					A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	16	9	16	9	16	9	16	9
4	35	9	19	0	35	9	19	0
6	55	9	20	0	56	0	20	3
8	76	0	20	3	76	0	20	0
10	96	0	20	0	96	6	20	6
12	116	3	20	3	116	9	20	3
14	136	6	20	3	137	6	20	9
16	157	0	20	6	158	6	21	0
18	178	0	21	0	179	9	21	3
20	198	9	20	9	201	0	21	3
22	219	9	21	0	222	3	21	3
24	240	9	21	0*	244	0	21	9*
26	262	0	21	3	265	6	21	6
28	283	3	21	3	287	3	21	9
30	304	9	21	6	309	0	21	9
			4)85	0			86	9
			2)21	3			21	8.25
			10	7.5			10	10.125
			10	10.125				
			2)21	5.625				

Velocity with a Motive Weight of 536 lbs.. 10 8.8125 or 10.734

SATURDAY, October 5, 1793.

Parallelopipedon A lengthened, called E.

Total Weight 7504½ lbs. Motive Weight 670 lbs.

Accel. Wt. large ball.					A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	20	6	20	6	20	3	20	3	20	0	20	0
4	42	3	21	9	42	0	21	9	41	9	21	9
6	65	0	22	9	64	3	22	3	63	9	22	0
8	87	6	22	6	86	6	22	3	86	9	22	3
10	110	6	23	0	109	3	22	9	108	3	22	3
12	133	6	23	0	131	9	22	6	131	0	22	9
14	156	6	23	0	.....		.....		154	0	23	0
16	179	9	23	3	178	3	46	6	177	3	23	3
18	203	3	23	6*	201	9	23	6*	200	6	23	3*
20	226	6	23	3	225	3	23	6	224	3	23	9
22	250	3	23	9	249	3	24	0	247	9	23	6
24	274	0	23	9	273	3	24	0	271	9	24	0
26	297	6	23	6	297	3	24	0	295	6	23	9
			5)117	9			119	0			118	3
			2)23	6.6			23	9.6			23	7.8
			11	9.3			11	10.8			11	9.9
							11	9.3				
							11	9.9				
							3)35	6.0				
Velocity with a Motive Weight of 670 lbs..							11	10.0 or 11.833				

Triangle F, dividing the water with its base.

Length of the perpendicular 43.125 feet. Depth 1.219 feet. Breadth 4.7416 feet. Area of the base 5.78 feet. Angle of incidence 3° 9′ 2″.*

F

	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment	3.6108	4.8620	6.5416	7.8333	8.8000	9.7656	10.708
Hutt. Correction, or Regular Series	3.5901	4.8697	6.6053	7.8945	8.9592	9.8830	10.708

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	3.6627	17.714	44.538	85.667	142.29	215.39	305.78	414.32	541.56	688.18	854.72	1041.70
Motive Weights Vertex foremost	1.1122	5.7249	14.928	29.468	49.936	76.842	110.62	151.69	200.38	257.05	321.98	395.50
Difference of Resistance.....	2.5505	11.9891	29.610	56.199	92.354	138.548	195.16	262.63	341.18	431.13	532.74	646.20

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.														
67 and	134	2.3298													
	268	2.3328	134 ..	268	2.3359										
	402	2.3136		402	2.3035	268 ..	402	2.2500							
	536	2.3343		536	2.3366		536	2.3372	402 ..	536	2.4722				
	670	2.3143		670	2.3077		670	2.2869		670	2.3169	536 ..	670	2.1433	
	804	2.2960		804	2.2694		804	2.2293		804	2.2174		804	2.0661	670 .. 804 1.9791

21)47.7523

Mean 134 and 804 2.2739

* Query 3° 8′ 48″?—See Fig. F. Vertex foremost, p. 33.

THURSDAY, October 3, 1793.

Triangle F, dividing the water with its base.

Total Weight 746 lbs. Motive Weight 67 lbs. Small Blocks.

Accelerating Wt. none.				Accel. Wt. none.				Accel. Wt. none.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
8	22	3	22 3	24	3	24 3		21	0	21 0		22	3	22 3		23	6	23 6	
16	48	3	26 0	51	0	26 9		46	3	25 3		48	3	26 0		49	9	26 3	
24	75	6	27 3	78	6	27 9		73	0	26 9		75	6	27 3		77	0	27 3	
32	103	3	27 9	106	0	27 6		100	6	27 6		103	3	27 9		104	6	27 6	
40	131	0	27 9	134	3	28 3		128	3	27 9		131	3	28 0		132	6	28 0	
48	159	0	28 0	162	9	28 6		156	0	27 9		159	9	28 6		160	9	28 3	
56	187	9	28 9	191	6	28 9		184	6	28 6		188	3	28 6		189	9	29 0	
64	216	6	28 9*	220	0	28 6*		212	9	28 3*		217	0	28 9*		218	9	29 0*	
72	245	0	28 6	248	6	28 6		241	6	28 9		246	6	29 6		243	6	29 0	
80	273	6	28 6	277	3	28 9		270	3	28 9		275	9	29 3		276	3	28 6	
88	302	6	29 0	306	0	28 9		299	3	29 0		306	0	30 3		305	9	29 6	
			4)114 9			114 6				114 9				117 9				116 0	
			8)28 8.25			28 7.5				28 8.25				29 5.25				29 0.0	
			3 7.03			3 6.94				3 7.03				3 8.16				3 7.5	
										3 7.03									
										3 6.94									
										3 8.16									
										3 7.50									
										5)18 0.66									

Velocity with a Motive Weight of 67 lbs... 3 7.33 or 3.6108

WEDNESDAY, October 2, 1793.

Triangle F, dividing the water with its base.

Total Weight 1443 lbs. Motive Weight 134 lbs.

Accelerating Wt. none.				Accel. Wt. none.				Accel. Wt. none.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
4	16	3	16 3	14	6	14 6		15	9	15 9		14	3	14 3		15	0	15 0	
8	33	9	17 6	31	9	17 3		33	6	19 9		32	0	17 9		33	0	18 0	
12	52	3	18 6	50	3	18 6		52	0	18 6		50	0	18 0		51	9	18 9	
16	70	9	18 6	69	0	18 9		70	9	18 9		69	0	19 0		70	9	19 0	
20	89	6	18 9	88	0	19 0		90	0	19 3		88	3	19 3		89	9	19 0	
24	108	6	19 0	107	0	19 0		109	0	19 0		107	9	18 6		109	3	19 6	
28	127	6	19 0	126	6	19 6		128	3	19 3		127	3	19 6		128	3	19 0	
32	146	9	19 3	145	6	19 0		147	6	19 3		146	9	19 6		148	3	20 0	
36	165	9	19 0	164	9	19 3		167	0	19 6		166	6	19 9		167	9	19 6	
40	185	3	19 6	184	3	19 6		186	3	19 3		186	6	20 0		187	6	19 9	
44	204	6	19 3	203	6	19 3		205	6	19 3		206	3	19 9		207	3	19 9	
48	223	6	19 0*	223	0	19 6*		224	9	19 3*		226	0	19 9*		227	0	19 9*	
52	242	9	19 3	242	3	19 3		244	3	19 6		246	0	20 0		246	9	19 9	
56	262	3	19 6	261	6	19 3		263	6	19 3		266	0	20 0		266	6	19 9	
60	281	6	19 3	280	9	19 3		283	0	19 6		285	6	19 6		286	3	19 9	
64	300	9	19 3	300	0	19 3		302	3	19 3		305	0	19 6		305	9	19 6	
68	319	9	19 0	319	3	19 3		321	3	19 0		.....		.....		.....		.....	
			6)115 3			115 9				115 9				5)98 9				98 6	
			4)19 2.5			19 3.5				19 3.5				19 9				19 8.4	
			4 9.62			4 9.875				4 9.875				4 11.25				4 11.1†	
										4 9.620									
										4 9.875									
										4 11.250									
										4 11.100									
										5)24 3.720									
Velocity with a Motive Weight of 134 lbs..										4 10.344 or 4.862									

† The fifth experiment was made on Thursday, October 3, 1793.

SATURDAY, October 5, 1793.

Triangle F, dividing the water with its base.

Total Weight 325 1/2 lbs. Motive Wt. 268 lbs.								
Accel. Wt. large ball.					A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.	
4	28	0	28	0	28	0	28	0
8	55	9	27	9	56	0	28	0
12	81	3	25	6	81	3	25	3
16	106	0	24	9	105	9	24	6
20	130	9	24	9	130	6	24	9
24	155	9	25	0	155	3	24	9
28	181	3	25	6	180	6	25	3
32	206	6	25	3	205	9	25	3
36	232	3	25	9	231	3	25	6
40	258	6	26	3*	257	3	26	0*
44	284	9	26	3	283	3	26	0
48	310	9	26	0	309	9	26	6
			3)78	6			78	6
			4)26	2			26	2
			6	6.5			6	6.5
			6	6.5				
			2)13	1.0				

Velocity with a Motive Weight of 268 lbs. . 6 6.5 or 6.5416

FRIDAY, October 4, 1793.

Triangle F, dividing the water with its base.

Total Weight 4683½ lbs. Motive Weight 402 lbs.												
Accel. Wt. large ball.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	12	6	12 6	12	6	12 6		12	9	12 9	
4	26	0	13 6	26	0	13 6		26	0	13 3	
6	39	6	13 6	39	9	13 9		39	9	13 9	
8	53	6	14 0	53	3	13 6		54	0	14 3	
10	68	0	14 6	67	6	14 3		68	6	14 6	
12	82	6	14 6	82	0	14 6		83	0	14 6	
14	97	0	14 6	96	6	14 6		97	6	14 6	
16	112	0	15 0	111	0	14 6		112	6	15 0	
18	126	6	14 6	125	6	14 6		127	6	15 0	
20	141	6	15 0	140	6	15 0		142	3	14 9	
22	156	6	15 0	155	3	14 9		157	9	15 6	
24	171	3	14 9	170	0	14 9		172	9	15 0	
26	187	3	16 0	185	3	15 3		188	0	15 3	
28	202	3	15 0	200	3	15 0		203	3	15 3	
30	217	6	15 3	215	6	15 3		218	9	15 6	
32	233	3	15 9	230	6	15 0		234	3	15 6	
34	248	9	15 6	246	0	15 6		249	9	15 6	
36	264	6	15 9*	261	3	15 3*		265	6	15 9*	
38	280	3	15 9	276	6	15 3		281	3	15 9	
40	296	3	16 0	292	0	15 6		296	9	15 6	
42	312	3	16 0	307	9	15 9		312	6	15 9	
			4)63 6			61 9				62 9	
			2)15 10.5			15 5.25				15 8.25	
			7 11.25			7 8.625				7 10.125 †	
						7 11.250					
						7 10.125					
						3)23 6.000					
Velocity with a Motive Weight of 402 lbs...						7 10.000 or 7.8333					

† The last two experiments were made on Saturday, October 5, 1793.

Digitized by Google

THURSDAY, October 3, 1793.

Triangle F, dividing the water with its base.

Total Weight 6156¼ lbs. Motive Weight 536 lbs.

Accelerating Wt. none.					Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	12	6	12	6	12	3	12	3	14	6	14	6
4	26	3	13	9	26	3	14	0	30	0	15	6
6	41	9	15	6	41	6	15	3	46	0	16	0
8	58	0	16	3	58	0	16	6	62	3	16	3
10	74	6	16	6	74	9	16	9	78	9	16	6
12	91	3	16	9	91	3	16	6	95	9	17	0
14	108	0	16	9	107	9	16	6	112	9	17	0
16	125	0	17	0	124	9	17	0	129	9	17	0
18	142	3	17	3	142	3	17	6	146	9	17	0
20	159	3	17	0	160	0	17	9	164	0	17	3
22	176	6	17	3	177	0	17	0	181	3	17	3
24	194	0	17	6	194	6	17	6	198	9	17	6
26	211	3	17	3	211	9	17	3	216	0	17	3
28	228	6	17	3*	229	3	17	6*	233	6	17	6*
30	246	0	17	6	247	0	17	9	251	0	17	6
32	263	6	17	6	264	6	17	6	268	6	17	6
34	281	0	17	6	282	3	17	9	286	3	17	9
36	298	9	17	9	300	3	18	0	304	0	17	9
38	316	3	17	6	.....		.....		.....		.....	
			6)105	0			5)88	6			88	0
			2)17	6			17	8.4			17	7.2
			8	9			8	10.2			8	9.6†
							8	9.0				
							8	9.6				
							3)26	4.8				

Velocity with a Motive Weight of 536 lbs.. 8 9.6 or 8.800

† The third experiment was made on Friday, October 4, 1793.

WEDNESDAY, October 9, 1793.

Triangle F, dividing the water with its base.

Total Weight 7504½ lbs.					Motive Wt. 670 lbs.			
Accel. Wt. large ball.					A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	19	0	19	0	18	6	18	6
4	38	6	19	6	38	0	19	6
6	57	3	18	9	57	3	19	3
8	75	9	18	6	75	9	18	6
10	94	3	18	6	94	6	18	9
12	113	0	18	9	113	9	19	3
14	131	9	18	9	132	9	19	0
16	150	6	18	9	151	9	19	0
18	169	6	19	0	171	0	19	3
20	188	9	19	3	190	3	19	3
22	207	9	19	0	209	6	19	3
24	227	0	19	3	228	9	19	3
26	246	3	19	3*	248	3	19	6*
28	265	9	19	6	267	9	19	6
30	285	3	19	6	287	6	19	9
32	304	9	19	6	307	3	19	9
			4)77	9			78	6
			2)19	5.25			19	7.5
			9	8.625			9	9.75
							9	8.625
							2)19	6.375
Velocity with a Motive Weight of 670 lbs. .							9	9.1875 or 9.7656

WEDNESDAY, October 9, 1793.

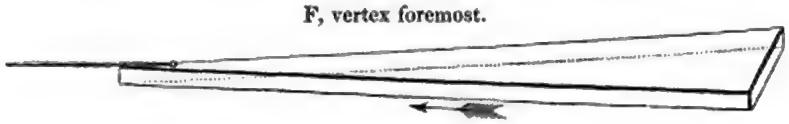
Triangle F, dividing the water with its base.

Total Weight 9034½ lbs. Motive Weight 804 lbs.												
Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.				
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	20	3	20 3	20	0	20 0		19	9	19 9	
4	41	3	21 0	41	3	21 3		41	3	21 6	
6	61	9	20 6	62	0	20 9		61	9	20 6	
8	82	3	20 6	82	3	20 3		82	6	20 9	
10	103	0	20 9	103	0	20 9		103	3	20 9	
12	124	0	21 0	124	3	21 3		124	0	21 0	
14	144	9	20 9	145	3	21 0		145	3	21 0	
16	165	9	21 0	166	6	21 3		166	6	21 3	
18	187	0	21 3	188	0	21 6		188	0	21 6	
20	208	0	21 0	209	3	21 3		209	6	21 6	
22	229	3	21 3*	230	9	21 6*		231	0	21 6*	
24	250	6	21 3	252	3	21 6		252	9	21 9	
26	271	9	21 3	273	9	21 6		274	3	21 6	
28	293	3	21 6	295	3	21 6		295	9	21 6	
30	314	6	21 3	316	3	21 0		317	3	21 6	
			5)106 6			107 0				107 9	
			2)21 3.6			21 4.8				21 6.6	
			10 7.8			10 8.4				10 9.3	
						10 7.8					
						10 9.3					
						3)32 1.5					
Velocity with a Motive Weight of 804 lbs. .						10 8.5 or 10.708					

Triangle F, dividing the water with its vertex.

Length of the oblique side 43.190 feet. Angle of incidence 3° 8′ 48″.*

F, vertex foremost.



	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment.....	5.6406	7.6458	9.9800	12.083	.....	.....	.....
Hutt. Correction, or Regular Series	5.6621	7.5914	10.1780	12.083	.....	.....	.....

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights...	1.1122	5.7249	14.928	29.468	49.936	76.842	110.62	151.69	200.38	257.05	321.98	395.50
M. W. Triangle F with an equilateral after body	.....	.....	.....	.....	.....	.....	116.09	164.13	222.78	292.72	374.81	469.86
Difference of Resistance	.....	.....	.....	.....	.....	.....	5.47	12.44	22.40	35.67	52.83	74.36

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.	
67 and	134	2.2788				
	268	2.4296	134 .. 268	2.6016		
	402	2.3520	402	2.4006	268 .. 402	2.1204

6) 14.1830

Mean.. 2.3638 = 67 and 402 lbs.

* In page 25, the same figure is given with the base foremost, and the angle of incidence is called 3° 9′ 2″; this is evidently an error in the Manuscript. Mr. JOHN CARY, the Optician, has been kind enough to calculate the angles of both figures from their respective data, and he finds that 3° 8′ 48″ is right.

WEDNESDAY, October 2, 1793.

Triangle F, dividing the water with its vertex.

Total Weight 746 lbs. Motive Weight 67 lbs. Small Blocks.												
Accelerating Wt. none.				Accel. Wt. none.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
4	11	3	11 3	10	9	10 9		11	6	11 6		13	3	13 3	
8	25	6	14 3	24	9	14 0		26	6	15 0		29	0	15 9	
12	40	9	15 3	40	0	15 3		43	6	17 0		46	6	17 6	
16	57	6	16 9	56	9	16 9		62	6	19 0		65	9	19 3	
20	75	6	18 0	74	9	18 0		82	3	19 9		86	3	20 6	
24	94	0	18 6	93	9	19 0		102	9	20 6		107	3	21 0	
28	113	6	19 6	113	3	19 6		123	3	20 6		128	6	21 3	
32	133	3	19 9	133	3	20 0		144	6	21 3		150	0	21 6	
36	153	6	20 3	153	9	20 6		165	9	21 3		171	3	21 3	
40	174	3	20 9	175	0	21 3		187	3	21 6		193	0	21 9	
44	195	3	21 0	196	6	21 6		208	9	21 6		214	9	21 9	
48	216	9	21 6	218	3	21 9		230	9	22 0		236	9	22 0	
52	238	9	22 0	240	6	22 3		252	9	22 0		259	0	22 3	
56	260	9	22 0	262	6	22 0		275	3	22 6*		281	6	22 6*	
60	283	0	22 3*	285	0	22 6*		297	9	22 6		304	3	22 9	
64	305	6	22 6	308	0	23 0		.....		.....		.....		.....	
			2)44 9			45 6				45 0				45 3	
			4)22 4.5			22 9				22 6				22 7.5	
			5 7.125			5 8.250				5 7.5				5 7.875	
						5 7.125									
						5 7.500									
						5 7.875									
						4)22 6.750									

Velocity with a Motive Weight of 67 lbs. . 5 7.6875 or 5.6406

WEDNESDAY, October 2, 1793.

Triangle F, dividing the water with its vertex.

Total Weight 1443 lbs.					Motive Weight 134 lbs.				Small Blocks.			
Accelerating Wt. none.					Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
4	16	3	16	3	17	0	17	0	17	3	17	3
8	37	6	21	3	39	0	22	0	38	6	21	3
12	62	3	24	9	63	9	26	9	63	9	25	3
16	89	0	26	9	90	6	26	9	90	9	27	0
20	116	9	27	9	118	9	28	3	118	9	28	0
24	145	9	29	0	148	3	29	6	148	3	29	6
28	175	6	29	9	178	3	30	0	178	3	30	0
32	205	6	30	0	208	6	30	3	208	3	30	0
36	235	9	30	3	239	0	30	6	239	0	30	9
40	264	9	29	0*	270	0	31	0*	270	0	31	0*
44	294	9	30	0	301	0	31	0	301	6	31	6
			2)59	0			62	0			62	6
			4)29	6			31	0			31	3
			7	4.5			7	9			7	9.75
							7	4.5				
							7	9.75				
							3)22	11.25				

Velocity with a Motive Weight of 134 lbs.. 7 7.75 or 7.6458

FRIDAY, September 27, 1793.

Triangle F, dividing the water with its vertex.

Total Weight 3227 lbs. Motive Weight 268 lbs.												
Accel. Wt. large ball.				A. Wt. large ball.				A. Wt. large ball.				
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.		
2	14	0	14 0	14	0	14	0	15	0	15	0	
4	31	6	17 6	31	3	17	3	32	3	17	3	
6	50	6	19 0	50	3	19	0	51	0	18	9	
8	69	9	19 3	69	0	18	9	70	0	19	0	
10	88	9	19 0	88	0	19	0	88	9	18	9	
12	107	0	18 3	106	6	18	6	107	3	18	6	
14	125	3	18 3	124	9	18	3	125	6	18	3	
16	143	6	18 3	143	0	18	3	143	6	18	0	
18	161	6	18 0	161	0	18	0	161	6	18	0	
20	179	9	18 3	179	6	18	6	179	6	18	0	
22	198	3	18 6	197	9	18	3	198	0	18	6	
24	216	9	18 6	216	3	18	6	216	6	18	6	
26	236	0	19 3	235	3	19	0	235	6	19	0	
28	255	3	19 3	254	6	19	3	254	6	19	0	
30	274	6	19 3	274	0	19	6	274	0	19	6	
32	294	3	19 9	293	6	19	6	293	6	19	6	
34	314	3	20 0*	313	6	20	0*	313	3	19	9*	
36	334	3	20 0	333	6	20	0	333	3	20	0	
			2)40 0			40	0			39	9	
			2)20 0			20	0			19	10.5	
			10 0			10	0			9	11.25	
						10	0					
						9	11.25					
						3)29	11.25					

Velocity with a Motive Weight of 268 lbs. . 9 11.75 or 9.980

N. B. The batten was substituted instead of the tape.

SATURDAY, September 28, 1793.

Triangle F, dividing the water with its vertex.

Total Weight 4689 lbs. Motive Weight 402 lbs.												
Accel. Wt. large ball.					A. Wt. large ball.				A. Wt. large ball.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	16	9	16	9	17	9	17	9	17	9	17	9
4	37	0	20	3	38	3	20	6	38	3	24	6
6	58	6	21	6	60	0	21	9	59	9	21	6
8	80	0	21	6	81	9	21	9	81	6	21	9
10	101	6	21	6	103	3	21	6	102	9	21	3
12	123	0	21	6	124	9	21	6	124	0	21	3
14	144	6	21	6	146	3	21	6	145	6	21	6
16	166	9	22	3	168	3	22	0	167	6	22	0
18	189	0	22	3	190	9	22	6	189	9	22	3
20	211	6	22	6	213	3	22	6	212	3	22	6
22	234	9	23	3	236	6	23	3	235	3	23	0
24	258	0	23	3	259	9	23	3	258	9	23	6
26	282	0	24	0	283	9	24	0	282	9	24	0
28	306	0	24	0*	307	9	24	0*	307	0	24	3*
30	330	0	24	0	332	3	24	6	331	3	24	3
			2)48	0			48	6			48	6
			2)24	0			24	3			24	3
			12	0			12	1.5			12	1.5
							12	0.0				
							12	1.5				
							3)36	3.0				
Velocity with a Motive Weight of 402 lbs. .							12	1.0 or 12.083				

Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its base.

Length of the Parallelopipedon 10 feet 4 in. Breadth 3.668 feet. Depth 1.219 feet. Area of the end 4.4713 feet. Length of Triangle 32.79 feet. Angle of incidence 3° 9′ 2″.

H

	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment.....	4.1025	5.6002	7.5138	8.8645	.....	.....	.....
Hutt. Correction, or Regular Series	4.1561	5.5884	7.5138	8.9346	.....	.....	.....

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights..	2.3860	12.089	31.235	61.255	103.28	158.27	227.05	310.38	408.93	523.32	654.15	801.95

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.						
67 and	134	2.2274					
	268	2.2909	134..268	2.3581			
	402	2.3255	402	2.3922	268..402	2.4527	

6) 14.0468

Mean 134 and 268. 2.3411

THURSDAY, October 17, 1793.

Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its base.

Total Weight 736 lbs.				Motive Weight 67 lbs.				Small Blocks.			
Accelerating Wt. none.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
4	12	0	12 0	12	0	12	0	12	0	12	0
8	25	3	13 3	25	6	13	6	25	3	13	3
12	39	3	14 0	39	6	14	0	39	6	14	3
16	54	0	14 9	54	0	14	6	54	0	14	6
20	69	0	15 0	69	0	15	0	69	0	15	0
24	84	3	15 3	84	3	15	3	84	3	15	3
28	99	9	15 6	100	0	15	9	99	9	15	6
32	115	6	15 9	115	6	15	6	115	6	15	6
36	131	6	16 0	131	6	16	0	131	6	16	0
40	147	3	15 9	147	6	16	0	147	6	16	0
44	163	3	16 0	163	6	16	0	163	6	16	0
48	179	3	16 0	179	9	16	3	179	9	16	3
52	195	3	16 0	196	0	16	3	196	0	16	3
56	211	6	16 3	212	3	16	3	212	3	16	3
60	227	9	16 3*	228	6	16	3*	228	9	16	6*
64	244	0	16 3	245	0	16	6	245	0	16	3
68	260	6	16 6	261	6	16	6	261	6	16	6
72	277	0	16 6	278	3	16	9	277	9	16	3
76	293	6	16 6	294	9	16	6	294	0	16	3
80	309	9	16 3	311	3	16	6	310	6	16	6
84	326	0	16 3	327	9	16	6	...	....	.....	

7)114 6

4)16 4.28

4 1.07

115 6

16 6

4 1.5
4 1.07
4 1.12

3)12 3.69

6)98 3

16 4.5

4 1.12

Velocity with a Motive Weight of 67 lbs.. 4 1.23 or 4.1025

FRIDAY, October 18, 1793.

Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its base.

Total Weight 1435 lbs. Motive Weight 134 lbs. Small Blocks.

Accelerating Wt. none.				Accel. Wt. none.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
4	16	9	16 9	16	3	16	3	17	0	17	0	17	0	17	0
8	36	3	19 6	35	0	18	9	37	0	20	0	36	9	19	9
12	57	0	20 9	55	3	20	3	58	0	21	0	57	6	20	9
16	78	6	21 6	76	6	21	3	79	6	21	6	79	0	21	6
20	100	6	22 0	98	6	22	0	101	6	22	0	101	0	22	0
24	122	6	22 0	120	6	22	0	123	6	22	0	123	0	22	0
28	144	6	22 0	142	6	22	0	145	9	22	3	145	0	22	0
32	166	6	22 0	164	6	22	0	168	3	22	6	167	3	22	3
36	188	6	22 0	186	9	22	3	191	0	22	9	189	6	22	3
40	210	6	22 0	208	9	22	0	213	9	22	9	212	0	22	6
44	232	6	22 0	231	0	22	3	236	9	23	0	234	6	22	6
48	254	6	22 0*	253	3	22	3*	259	6	22	9*	257	3	22	9*
52	276	6	22 0	275	9	22	6	282	3	22	9	280	0	22	9
56	298	6	22 0	298	3	22	6	304	9	22	6	302	6	22	6
60	320	6	22 0	320	6	22	3	.....		.....		324	9	22	3
			4)88 0			89	6			3)68	0			4)90	3
			4)22 0			22	4.5			22	8			22	6.75
			5 6			5	7.12			5	8			5	7.69
						5	6.00								
						5	8.00								
						5	7.69								
						4)22	4.81								

Velocity with a Motive Weight of 134 lbs. . 5 7.2025 or 5.6002

MONDAY, October 21, 1793.

Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its base.

Total Weight 3343 lbs. Motive Weight 268 lbs.												
Accel. Wt. both balls.				A. Wt. both balls.				A. Wt. both balls.				
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	14	3	14	3	13	3	13	3	13	6	13	6
4	30	0	15	9	28	9	15	6	29	0	15	6
6	45	9	15	9	44	6	15	9	44	9	15	9
8	61	0	15	3	59	6	15	0	60	0	15	3
10	75	9	14	9	74	3	14	9	74	6	14	6
12	90	0	14	3	88	3	14	0	89	0	14	6
14	104	3	14	3	102	6	14	3	103	0	14	0
16	118	3	14	0	116	3	13	9	116	9	13	9
18	132	3	14	0	130	3	14	0	130	9	14	0
20	146	3	14	0	144	3	14	0	144	6	13	9
22	160	3	14	0	158	0	13	9	158	6	14	0
24	174	3	14	0	172	3	14	3	172	9	14	3
26	188	6	14	3	186	6	14	3	187	0	14	3
28	202	9	14	3	200	9	14	3	201	3	14	3
30	217	0	14	3	215	0	14	3	215	9	14	6
32	231	9	14	9	229	6	14	6	230	3	14	6
34	246	6	14	9	244	3	14	9	244	9	14	6
36	261	3	14	9	259	0	14	9	259	6	14	9
38	276	0	14	9	273	9	14	9	274	3	14	9
40	291	3	15	3*	288	6	14	9*	289	3	15	0*
42	306	3	15	0	303	6	15	0	304	3	15	0
44	321	6	15	3	318	6	15	0	319	3	15	0
			3)45	6			44	9			45	0
			2)15	2			14	11			15	0
			7	7			7	5.5			7	6
							7	7.0				
							7	6.0				
							3)22	6.5				

Velocity with a Motive Weight of 268 lbs. . . . 7 6.166 or 7.5138

MONDAY, October 21, 1793.

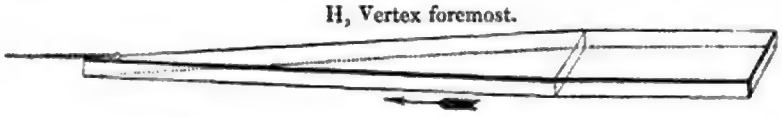
Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its base.

Total Weight 4779¼ lbs. Motive Weight 402 lbs.												
Accelerating Wt. none.				Accel. Wt. none.				Accel. Wt. none.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.		Feet.	In.	Differences.	
2	12	6	12	6	12	0	12	0	11	6	11	6
4	26	6	14	0	25	9	13	9	25	9	14	3
6	41	6	15	0	40	6	14	9	40	6	14	9
8	57	0	15	6	56	0	15	6	56	0	15	6
10	73	0	16	0	72	0	16	0	72	0	16	0
12	89	0	16	0	88	3	16	3	88	6	16	6
14	105	6	16	6	104	9	16	6	105	0	16	6
16	122	0	16	6	121	3	16	6	121	9	16	9
18	139	0	17	0	138	0	16	9	138	9	17	0
20	155	9	16	9	155	0	17	0	155	6	16	9
22	173	0	17	3	172	3	17	3	173	0	17	6
24	190	6	17	6	189	6	17	3	190	6	17	6
26	207	9	17	3	207	0	17	6	208	0	17	6
28	225	3	17	6	224	6	17	6	226	0	18	0
30	242	9	17	6	241	9	17	3	244	0	18	0
32	260	3	17	6*	259	6	17	9*	262	0	18	0*
34	277	9	17	6	277	0	17	6	279	9	17	9
36	295	6	17	9	294	6	17	6	297	9	18	0
38	313	3	17	9	312	3	17	9	315	9	18	0
			4)70	6			70	6			71	9
			2)17	7.5			17	7.5			17	11.25
			8	9.75			8	9.75			8	11.625
							8	9.75				
							8	11.625				
							3)26	7.125				

Velocity with a Motive Weight of 402 lbs. . . . 8 10.375 or 8.8645

Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its vertex. Angle of incidence 3° 9′ 2″.

H, Vertex foremost.



	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment	6.4650	7.7916	10.8125	.....	.....	.....	.....
Hutt. Correction, or Regular Series	5.6149	7.7916	10.8125	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.			
67 and	134	3.7138		
	268	2.6957	134..268	2.1158

3)8.5253

Mean 2.8418 = 67 and 268

THURSDAY, October 17, 1793.

Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its vertex.

Total Weight 751 lbs. Motive Weight 67 lbs. Small Blocks.											
Accelerating Wt. 285 lbs.				Accel. Wt. 285 lbs.				Accel. Wt. 285 lbs.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.		Feet.	In.	Differences.	
4	16	3	16 3	16	9	16	9	17	0	17	0
8	36	0	19 9	36	6	19	9	37	3	20	3
12	58	0	22 0	58	6	22	0	59	9	22	6
16	81	0	23 0	81	9	23	3	83	0	23	3
20	104	3	23 3	105	0	23	3	106	6	23	6
24	128	0	23 9	128	9	23	9	130	3	23	9
28	151	9	23 9	152	6	23	9	154	3	24	0
32	175	6	23 9	176	9	24	3	178	6	24	3
36	200	0	24 6	201	3	24	6	203	3	24	9
40	224	9	24 9	226	3	25	0	228	3	25	0
44	250	0	25 3	251	6	25	3	253	9	25	6
48	275	9	25 9*	277	3	25	9*	279	6	25	9*
52	301	9	26 0	303	0	25	9	305	6	26	0
56	327	9	26 0	329	0	26	0	331	3	25	9
			3)77 9			77	6			77	6
			4)25 11			25	10			25	10
			6 5.75			6	5.5			6	5.5
						6	5.75				
						6	5.50				
						3)19	4.75				
Velocity with a Motive Weight of 67 lbs. .						6	5.583 or 6.465				

SATURDAY, October 19, 1793.

Parallelopipedon with a Triangle joined to its base, called H, drawn through the water by its vertex.

T. W. 1819¼ lbs. M. W. 134 lbs. large blocks.

Accel. Wt. both balls.					A. Wt. both balls.			
Sec.	Feet.	In.	Differences.		Feet.	In.	Differences.	
2	11	3	11	3	13	3	13	3
4	25	0	13	9	29	0	15	9
6	41	0	16	0	44	6	15	6
8	56	3	15	3	60	0	15	6
10	71	3	15	0	74	9	14	9
12	86	3	15	0	89	3	14	6
14	100	6	14	3	103	6	14	3
16	114	9	14	3	117	6	14	0
18	128	9	14	0	131	6	14	0
20	142	9	14	0	145	3	13	9
22	156	6	13	9	159	3	14	0
24	170	6	14	0	173	6	14	3
26	184	6	14	0	187	6	14	0
28	198	9	14	3	202	0	14	6
30	213	0	14	3	216	6	14	6
32	227	6	14	6	231	3	14	9
34	242	3	14	9	246	6	15	3
36	257	3	15	0	261	6	15	0
38	272	6	15	3	277	0	15	6*
40	287	6	15	0*	292	6	15	6
42	303	3	15	9	308	3	15	9
44	319	3	16	0	.....		.....	
			3)46	9			46	9
			2)15	7			15	7
			7	9.5			7	9.5
			7	9.5				
			2)15	7.0				

Velocity with a Motive Weight of 134 lbs.. 7 9.5 or 7.7916

TUESDAY, October 22, 1793.

Parallelopipedon with a Triangle joined to its base, called H. drawn through the water by its vertex.

Total Weight 3343 lbs. Motive Weight 268 lbs.												
Accel. Wt. both balls.			A. Wt. both balls.			A. Wt. both balls.			A. Wt. both balls.			
Sec.	Feet.	In.	Differences.	Feet.	In.	Differences.	Feet.	In.	Differences.	Feet.	In.	Differences.
2	14	0	14 0	15	0	15 0	13	0	13 0	13	9	13 9
4	31	6	17 6	32	9	17 9	30	3	17 3	31	0	17 3
6	50	3	18 9	52	0	19 3	48	6	18 3	49	6	18 6
8	69	0	18 9	71	0	19 0	67	6	19 0	68	6	19 0
10	88	3	19 3	90	6	19 6	86	6	19 0	87	6	19 0
12	107	6	19 3	110	0	19 6	105	6	19 0	106	6	19 0
14	126	9	19 3	129	6	19 6	124	9	19 3	125	9	19 3
16	146	0	19 3	149	0	19 6	144	0	19 3	145	3	19 6
18	165	6	19 6	168	9	19 9	163	9	19 9	165	0	19 9
20	185	6	20 0	189	0	20 3	183	9	20 0	185	0	20 0
22	205	6	20 0	209	0	20 0	203	9	20 0	205	0	20 0
24	226	0	20 6	229	6	20 6	224	0	20 3	225	3	20 3
26	246	6	20 6	250	3	20 9	244	6	20 6	246	0	20 9
28	267	3	20 9	271	6	21 3	265	6	21 0	266	9	20 9
30	288	9	21 6*	293	0	21 6*	287	0	21 6*	288	3	21 6*
32	310	6	21 9	315	0	22 0	308	6	21 6	310	0	21 9
			2)43 3			43 6			43 0			43 3
			2)21 7.5			21 9			21 6			21 7.5
			10 9.75			10 10.5			10 9			10 9.75
						10 9.75						
						10 9.00						
						10 9.75						
						4)43 3.00						

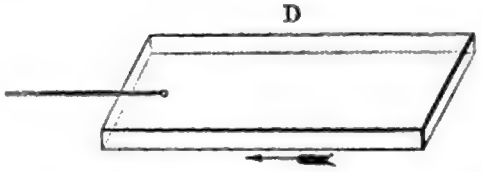
Velocity with a Motive Weight of 268 lbs. . 10 9.75 or 10.8125

GENERAL TABLE, 1793.

	Page.	Feet per Second.											
		1	2	3	4	5	6	7	8	9	10	11	12
Parallelopipedon A	1	2.9050	14.620	37.574	73.406	123.40	188.66	270.11	368.59	484.88	619.81	773.54	947.23
..... B	7	2.2966	11.743	30.502	60.045	101.53	155.96	224.19	307.00	405.08	519.13	649.72	797.42
..... C	11	4.9900	21.512	50.568	92.737	148.44	218.00	301.71	399.78	512.46	639.96	782.25	939.74
..... E	19	1.6988	9.086	24.230	48.595	83.377	129.60	188.18	259.93	345.59	445.95	561.54	693.10
Triangle F, Base foremost.....	25	3.6627	17.714	44.538	85.667	142.29	215.39	305.78	414.32	541.56	688.18	854.72	1041.7
Triangle F, Vertex foremost..	33	1.1122	5.7249	14.928	29.468	49.936	76.842	110.62	151.69	200.38	257.05	321.98	395.50
Compound H, Base foremost	38	2.3890	12.089	31.235	61.255	103.28	158.27	227.05	310.38	408.93	523.32	654.15	801.95

Parallelopipedon D. Length 21.099 feet. Breadth 7.336 feet. Depth 1.219 feet. Area of the end 8.9426.*

D



	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment	2.859	.....	.....	6.4541	.....	.....	.....
Hutt. Correction, or Regular Series	2.859	.....	.....	6.4541	.....	.....	.....

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	.....	.....	.....	.....	.....	342.38	.....	.....	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

$$\left|\begin{matrix}\text{lbs.}\\67\end{matrix}\text{ and }\begin{matrix}\text{lbs.}\\402\end{matrix}\right| 2.2005 \Big| = 67 \,..\, 402.$$

* Parallelopipedon D has the same length, but twice the breadth of Parallelopipedon B. See p. 7.

SATURDAY, July 19, 1794.

Parallelopipedon D.

Thermometer in the Air, 72½°;—In the Dock, 73½°.—Depth of Water 11 feet 10 in.—Weather, Calm.

Total Weight 778 lbs. Motive Weight 67 lbs. T.W.750. M.W.67.

Accelerating Wt. 352 lbs.			Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. 352 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
8	20.5 †	20.5	16.9	16.9	16.5	16.5	17.0	17.0	21.7	21.7
16	44.3	23.8	36.2	19.3	35.6	19.1	36.3	19.3	44.5	22.8
24	69.4	25.1	56.7	20.5	55.8	20.2	56.7	20.4	66.8	22.3
32	94.3	24.9	77.8	21.1	76.6	20.8	77.9	21.2	88.4	21.6
40	118.3	24.0	99.3	21.5	97.6	21.0	99.3	21.4	109.8	21.4
48	141.8	23.5	120.8	21.5	118.7	21.1	121.1	21.8	131.2	21.4
56	165.1	23.3	142.7	21.9	140.0	21.3	143.2	22.1	152.7	21.5
64	188.0	22.9	164.6	21.9	161.4	21.4	165.5	22.3	174.4	21.7
72	210.5	22.5	186.7	22.1	183.0	21.6	188.0	22.5	196.2	21.8
80	233.1	22.6	208.9	22.2	204.8	21.8	210.5	22.5	218.2	22.0
88	255.9	22.8	231.3	22.4	226.8	22.0	233.2	22.7	240.4	22.2
96	278.9	23.0*	253.8	22.5	249.0	22.2	256.0	22.8	262.8	22.4*
104	301.9	23.0	276.7	22.9*	271.0	22.0*	279.1	23.1*	285.3	22.5
112	324.9	23.0	299.6	22.9	294.1	23.1	302.3	23.2	307.9	22.6
120	.....	.....	323.0	23.4	316.9	22.8	325.5	23.2	.....	.....
		3)69.0		69.2		67.9		69.5		67.5
		8)23.0		23.066		22.633		23.166		22.5
		2.875		2.883		2.829		2.895		2.812
				2.875						
				2.829						
				2.895						
				2.812						
				5)14.294						
				2.859	Velocity with a Motive Weight of 67 lbs.					

† This column for the year 1793, is calculated by feet and inches; from the commencement of the experiments in 1794 by feet and the decimal parts of a foot.—Ed.

SATURDAY, June 21, 1794.

Parallelopipedon D.

Thermometer in the Air, 62½°;—In the Dock, 65°.—Depth of Water 11 feet 1 in.—Weather almost Calm.

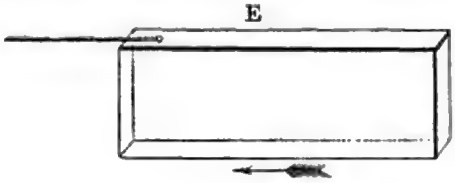
Total Weight 4828 lbs. Motive Weight 402 lbs.

Accel. Wt. large ball.			A. Wt. large ball.		A. Wt. large ball.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	24.6	24.6	24.5	24.5	25.3	25.3
8	50.8	26.2	51.3	26.8	49.3	24.0
12	75.2	24.4	79.0	27.7	73.0	23.7
16	99.4	24.2	104.8	25.8	96.9	23.9
20	123.6	24.2	129.5	24.7	121.1	24.2
24	148.1	24.5	154.2	24.7	145.6	24.5
28	172.9	24.8	178.8	24.6	170.3	24.7
32	197.9	25.0	203.6	24.8	195.1	24.8
36	223.1	25.2	228.7	25.1	220.1	25.0
40	248.3	25.2	253.8	25.1	245.2	25.1
44	273.8	25.5	279.4	25.6	270.7	25.5
48	299.5	25.7*	305.1	25.7*	296.3	25.6*
52	325.6	26.1	331.1	26.0	322.1	25.8
		2)51.8		51.7		51.4
		2)25.9		25.85		25.7
		6.475		6.4625		6.425
		6.4625				
		6.4250				
		3)19.3625				
		6.4541 Velocity with a Motive Weight of 402 lbs.				

Twenty turns round the small Rope measured 20¾ inches.
Sixteen ditto large Rope ditto 28¼ ....

Parallelopipedon D on its edge, called E.

E



	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment.....	2.578	.....	.....	6.2138	.....	.....	8.8437
Hutt. Correction, or Regular Series	2.5616	.....	.....	6.2595	.....	.....	8.8437

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights..	.....	40.787	.....	163.75	.....	369.27	.....	657.55	.....	.....	.....	1482.8

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.			
67 and	402	2.0367	402 .. 804	1.9639
	804	2.0159		
				3)6.0165
			Mean 67 and 804	2.0055

Digitized by Google

TUESDAY, July 15, 1794.

Parallelopipedon D on its edge, called E.

Thermometer in the Air, 71°;—In the Dock, 73°.—Depth of Water, 12 feet 5 inches.—Light Breeze, S. W.

Total Weight 778 lbs. Motive Weight 67 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
8	16.2	16.2	15.5	15.5	15.6	15.6
16	34.5	18.3	33.1	17.6	33.4	17.8
24	53.7	19.2	51.8	18.7	52.2	18.8
32	73.5	19.8	71.3	19.5	71.3	19.1
40	93.8	20.3	91.4	20.1	91.2	19.9
48	114.2	20.4	111.4	20.0	111.2	20.0
56	134.7	20.5	131.3	19.9	131.5	20.3
64	155.4	20.7	151.4	20.1	152.1	20.6
72	176.1	20.7	171.6	20.2	172.7	20.6
80	196.9	20.8	191.7	20.1	193.2	20.5
88	217.6	20.7	212.1	20.4	213.9	20.7
96	238.1	20.5	232.8	20.7	234.8	20.9
104	258.7	20.6*	253.4	20.6	255.7	20.9
112	279.3	20.6	274.0	20.6*	276.6	20.9*
120	299.9	20.6	294.4	20.4	297.4	20.8
128	.....	.....	315.0	20.6	318.0	20.6
		3)61.8		61.6		62.3
		8)20.6		20.533		20.766
		2.575		2.566		2.595
		2.566				
		2.595				
		3)7.736				
		2.578 Velocity with a Motive Weight of 67 lbs.				

TUESDAY, July 15, 1794.

Parallelopipedon D on its edge, called E.

Thermometer in the Air, 71°;—In the Dock, 73°.—Depth of Water, 12 feet 5 inches.—Light Breeze, S. W.

Total Weight 4934½ lbs. Motive Weight 402 lbs.						
Accel. Wt. large ball.			A. Wt. large ball.		A. Wt. large ball.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	24.2	24.2	24.2	24.2	23.7	23.7
8	51.1	26.9	51.1	26.9	50.8	27.1
12	78.3	27.2	78.3	27.2	78.1	27.3
16	103.5	25.2	103.6	25.3	103.9	25.8
20	128.1	24.6	127.7	24.1	128.6	24.7
24	152.6	24.5	152.2	24.5	153.3	24.7
28	197.0†	24.4	176.7	24.5	178.0	24.7
32	201.6	24.6	201.2	24.5	202.6	24.6
36	226.4	24.8	225.8	24.6	227.3	24.7
40	251.2	24.8*	250.3	24.5*	251.8	24.5*
44	276 1	24.9	275.2	24.9	277.1	25.3
48	300.7	24.6	300.0	24.8	302.5	25.4
		3)74.3		74.2		75.2
		4)24.766		24.7333		25.066
		6.1916		6.1833		6.2666
		6.1833				
		6.2666				
		3)18.6415				
		6.2138 Velocity with a Motive Weight of 402 lbs.				

† Query 177 feet?

TUESDAY, July 15, 1794.

Parallelopipedon D on its edge, called E.

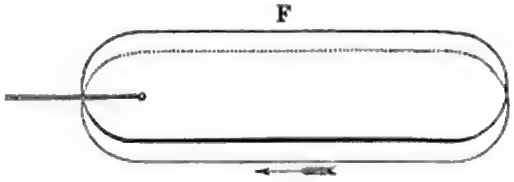
Total Wt. 9469½ lbs. T.W. 9229½ M.W. 804.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	14.4	14.4	14.1	14.1
4	30.2	15.8	29.2	15.1
6	46.5	16.3	45.0	15.8
8	63.1	16.6	61.2	16.2
10	80.2	17.1	77.5	16.3
12	97.5	17.3	94.3	16.8
14	114.7	17.2	111.2	16.7†
16	131.7	17.0	128.5	17.3
18	149.1	17.4	146.1	17.6
20	166.6	17.5	163.5	17.4
22	184.2	17.6	181.0	17.5
24	201.7	17.5	198.6	17.6
26	219.5	17.8	216.0	17.4
28	237.2	17.7*	233.5	17.5*
30	254.9	17.7	251.1	17.6
32	272.7	17.8	268.8	17.7
34	290.6	17.9	286.4	17.6
		4)71.1		70.4
		2)17.775		17.6
		8.8875		8.8
		8.8000		
		2)17.6875		
		8.8437 Velocity with a Motive Weight of 804 lbs.		

N B. The Total Weight in the first experiment is greater, the rope being dry; it having been found by experience that when the rope is sodden, a smaller Total Weight produces an equal Motive Weight.

† Query 16.9? Although the experiments were examined and the calculations verified five times by Colonel BEAUFOY (the last time shortly before his death), yet an error might possibly have been made in copying the column headed Feet. We have, therefore, printed the column of Differences as they stand in the original MS. and shall insert in the form of notes, throughout the work, the apparent inaccuracies in subtraction, as well as any other presumed mistakes, to shew that they have not escaped attention.—ED.

Parallelopipedon D, lengthened by adding a semicircular end to each extremity, called F.

F



	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment	3.5266	.....	6.1500	7.1937	.....	.....	9.4937
Hutt. Correction, or Regular Series	3.5345	4.6530	6.1251	7.1937	8.0361	8.8092	9.4696

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	2.7774	15.941	44.312	91.522	160.65	254.41	375.26	525.50	707.22	922.44	1173.0	1460.8

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.	lbs.		lbs.	lbs.	
67 and	268	2.4921	268 ..	402	2.5866	402 ..	804	2.4986
	402	2.5128		804	2.5302			
	804	2.5089						

6) 15.1292

Mean.... 2.5215 = 67 .. 402

WEDNESDAY, June 18, 1794.

Parallelopipedon D, lengthened by adding a semicircular end to each extremity, called F.

Thermometer in the Air, 60°;—In the Dock, 66°.—Depth of Water, 11 feet 9 inches.—Light Breeze, E. N. E.

Total Weight 800 lbs. Motive Weight 67 lbs.								
Accel. Wt. 134 lbs.			Accel. Wt. 134 lbs.		Accel. Wt. 134 lbs.		Accel. Wt. 134 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
8	19.7	19.7	19.0	19.0	19.6	19.6	19.0	19.0
16	43.6	23.9	42.2	23.2	43.1	23.5	42.4	23.4
24	69.2	25.6	67.9	25.7	68.6	25.5	68.4	26.0
32	95.6	26.4	95.3	27.4	95.8	27.2	96.3	27.9
40	122.0	26.4	123.1	27.8	123.0	27.2	124.5	28.2
48	149.0	27.0	151.1	28.0	150.5	27.5	152.6	28.1
56	176.2	27.2	178.7	27.6	177.8	27.3	180.3	27.7
64	203.6	27.4	206.3	27.6	205.0	27.2	208.0	27.7
72	231.3	27.7	233.7	27.4	232.6	27.6	235.8	27.8
80	259.0	27.7	261.4	27.7	260.2	27.6	263.9	28.1
88	287.0	28.0*	289.4	28.0*	288.2	28.0*	292.4	28.5*
96	315.1	28.1	317.4	28.0	316.6	28.4	321.1	28.7
		2)56.1		56.0		56.4		57.2
		8)28.05		28.0		28.2		28.6
		3.506		3.500		3.525		3.575
				3.506				
				3.525				
				3.575				
				4)14.106				
				3.5266 Velocity with a Motive Weight of 67 lbs.				

Digitized by Google

WEDNESDAY, June 11, 1794.

Parallelopipedon D lengthened, called F.

Total Weight 3385½ lbs. Motive Wt. 268 lbs.

	Accel. Wt. large ball.		A. Wt. large ball.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	22.3	22.3	23.0	23.0
8	44.9	22.6	48.7	25.7
12	67.5	22.6	73.7	25.0
16	90.4	22.9	97.8	24.1
20	113.6	23.2	121.3	23.5
24	137.0	23.4	145.2	23.9
28	160.8	23.8	169.0	23.8
32	184.7	23.9	192.8	23.8
36	208.8	24.1	216.9	24.1
40	233.0	24.2	240.9	24.0
44	257.4	24.4	265.2	24.3*
48	282.1	24.7*	290.0	24.8
52	306.7	24.6	.....	.....
		2)49.3		49.1
		4)24.65		24.55
		6.1625		6.1375
		6.1375		
		2)12.3000		
		6.1500	Velocity with a Motive Weight of 268 lbs.	

Digitized by Google

SATURDAY, June 14, 1794.

Parallelopipedon D lengthened, called F.

Thermometer in the Air, 71°;—In the Dock, 66½°.—Calm.

Total Weight 4726½ lbs. Motive Wt. 402 lbs.				
Accel. Wt. large ball. †		A. Wt. large ball.		
Sec.	Feet.	Differences.	Feet.	Differences.
4	26.0	26.0	25.2	25.2
8	55.4	29.4	54.4	29.2
12	84.2	28.8	83.1	28.7
16	112.6	28.4	111.5	28.4
20	140.9	28.3	139.8	28.3
24	169.3	28.4	168.1	28.3
28	197.7	28.4	196.6	28.5
32	226.3	28.6	225.2	28.6
36	254.9	28.6	253.6	28.4
40	284.0	29.1*	281.9	28.3*
44	313.1	29.1	310.5	28.6
		2)58.2		56.9
		4)29.1		28.45
		7.2750		7.1125
		7.1125		
		14.3875		
		7.1937 Velocity with a Motive Weight of 402 lbs.		

Total Weight 9147 lbs. Motive Wt. 804 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	30.4	30.4	32.2	32.2
8	65.8	35.4	68.4	36.2
12	103.0	37.2	105.5	37.1
16	140.8	37.8	143.3	37.8
20	178.9	38.1	181.2	37.9
24	217.3	38.4	219.3	38.1*
28	255.4	38.1*	257.2	37.9
32	293.2	37.8	294.4	.....
		2)75.9		76.0
		4)37.95		38.0
		9.4875		9.5 ‡
		9.5000		
		2)18.9875		
		Velocity with a M. Wt. of 804 lbs.. 9.4937		

† The Accelerating Weight was hung 7 feet 6 inches above the surface of the ground.

‡ The second experiment was made on Wednesday, June 18, 1794.

Isosceles Triangle, called K, drawn through the water by its base.

Length 30 feet 4 inches. Breadth 3 feet 4.5 inches. Depth 1 foot 2.625 inches. Area of the base 4.113 feet. Angle of incidence 2° 59′ 16″.

K

	Motive Weights.						
	67	134	201	402	536	670	804
Velocity per Experiment	4.1604	5.4874	6.725	9.0625	.....	.....	.....
Hutt. Correction, or Regular Series	4.1419	5.6235	6.725	9.1307	.....	.....	.....

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights...	2.6738	12.866	32.253	61.909	102.67	155.20	220.11	297.91	389.08	494.02	613.15	748.84
Motive Weights, Vertex foremost	1.2348	5.6652	13.811	25.990	42.442	63.362	88.913	119.24	154.49	194.74	240.11	290.70
Difference of Resistance.....	1.4390	7.2008	18.442	35.919	60.228	91.838	131.197	178.67	234.59	299.28	373.04	458.14

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.					
67 and	134	2.5038	134 ..	201	1.9937	201 .. 402 | 2.3235
	201	2.2877		402	2.1898	
	402	2.3014				

6) 13.5999

Mean.. 2.2666 = 67 and 201.

WEDNESDAY, August 20, 1794.

Isosceles Triangle, called K, drawn through the water by its base.

Depth of Water 11 feet 9 inches.

Motive Weight 67 lbs.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
20	71.0	..... †	69.4	.....
24	86.3	15.3	84.7	15.3
28	111.8	15.5	100.0	15.3
32	117.5	15.7	115.5	15.5
36	133.4	15.9	131.2	15.7
40	149.6	16.2	147.1	15.9
44	165.7	16.1	163.0	15.9
48	181.8	16.1	179.1	16.1
52	198.1	16.3	195.3	16.2
56	214.5	16.4	211.8	16.5
60	231.0	16.5*	228.3	16.5*
64	247.4	16.4	244.8	16.5
68	263.9	16.5	261.3	16.5
72	280.5	16.6	277.9	16.6
76	297.0	16.5	295.0	17.1
80	313.8	16.8	312.2	17.2
		6)99.3		100.4
		4)16.55		16.733
		4.1375		4.1833
		4.1833		
		2)8.3208		
		4.1604 Velocity with a Motive Weight of 67 lbs.		

Motive Weight 134 lbs.

Accelerating Wt. 389 lbs.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	20.7	20.7	18.4	18.4
8	43.5	22.8	38.7	20.3
12	66.9	23.4	59.6	20.9
16	89.5	22.6	81.0	21.4
20	111.2	21.7	102.5	21.5
24	132.7	21.5	124.0	21.5
28	154.4	21.7	145.8	21.8
32	176.0	21.6	167.6	21.8
36	197.5	21.5	189.5	21.9
40	219.2	21.7	211.3	21.8
44	240.9	21.7*	233.5	22.2*
48	262.6	21.7	255.4	21.9
52	284.7	22.1	277.4	22.0
56	306.7	22.0	299.4	22.0
		4)87.5		88.1
		4)21.875		22.025
		5.4687		5.5062
		5.5062		
		2)10.9749		
		Velocity with a M. Wt. of 134 lbs. 5.4874		

† To save time the differences prior to twenty seconds were not set down.

WEDNESDAY, August 27, 1794.

Isosceles Triangle, called K, drawn through the water by its base.

Thermometer in the Air, 60°;—In the Dock, 65½°.—Depth of Water, 11 feet 8 in.—Strong Breeze, W.S.W.

Motive Weight 201 lbs. †

Accelerating Wt. none.

Sec.	Feet.	Differences.
2	11.1	11.1
4	23.1	12.0
6	35.2	12.1
8	47.9	12.7
10	60.9	13.0
12	73.6	12.7
14	86.8	13.2
16	99.9	13.1
18	113.2	13.3
20	126.5	13.3
22	139.9	13.4
24	153.3	13.4
26	166.9	13.6
28	180.3	13.4
30	193.7	13.4
32	207.2	13.5
34	220.7	13.5
36	234.3	13.6
38	247.6	13.3
40	261.1	13.5
42	274.6	13.5
44	288.1	13.5*
46	301.5	13.4
48	314.8	13.3
50	328.4	13.6

4)53.8

2)13.45

6.725 Velocity with a Motive Weight of 201 lbs.

† The small blocks were used in this experiment.

TUESDAY, August 5, 1794.

Thermometer in the Air, 64½°;—In the Dock, 64½°.—Depth of Water, 10 feet 1 inch.—Fresh Breeze, W.N.W.

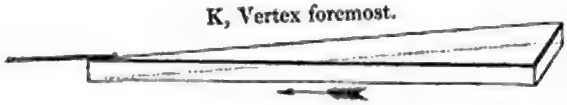
Total Weight 4910½ lbs. Motive Wt. 402 lbs.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	30.9	30.9	32.0	32.0
8	63.2	32.3	64.9	32.9
12	96.4	33.2	98.3	33.4
16	130.4	34.0	132.4	34.1
20	165.2	34.8	167.2	34.8
24	200.8	35.6	203.0	35.8
28	236.5	35.7	239.3	36.3
32	272.5	36.0*	275.8	36.5*
36	308.7	36.2	312.1	36.3
		2)72.2		72.8
		4)36.1		36.4
		9.025		9.1
		9.100		
		2)18.125		

9.0625 Velocity with a M. W. of 402 lbs.

Isosceles Triangle K, drawn through the water by its vertex. Angle of incidence 2° 59′ 16″.

K, Vertex foremost.



	Motive Weights.					
	67	134	201	268	335	402
Velocity per Experiment	6.5270	8.7437	10.1937	11.4875	12.800	.....
Hutt. Correction, or Regular Series	6.1544	8.4363	10.1454	11.564	12.800	.....

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	1.2348	5.6652	13.811	25.990	42.442	63.362	88.913	119.24	154.49	194.74	240.11	290.70

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
67 and	134	2.3707	134 ..	201	2.6420	201 ..	268	2.4091	268 .. 335	2.0618
	201	2.4641		268	2.5401		335	2.2440		
	268	2.4525		335	2.4044					
	335	2.3896								

10)21.9783

Mean..2.1978 = 201 .. 335

WEDNESDAY, August 20, 1794.

Isosceles Triangle K, drawn through the water by its vertex.

Depth of Water 11 feet 9 inches.

Motive Weight 67 lbs.						
Accelerating Wt. none.			A. Wt. 240 lbs.		A. Wt. 240 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	14.4	14.4	17.3	17.3	17.1	17.1
8	32.0	17.6	38.3	21.0	38.3	21.2
12	51.6	19.6	62.0	23.7	62.1	23.8
16	72.9	21.3	87.0	25.0	87.7	25.6
20	95.3	22.4	112.8	25.8	113.4	25.7
24	118.6	23.3	138.3	25.5	139.3	25.9
28	142.4	23.8	163.7	25.4	164.9	25.6
32	166.7	24.3	189.1	25.4	190.4	25.5
36	191.4	24.7	214.7	25.6	216.1	25.7
40	216.7	25.3	240.6	25.9*	242.2	26.1*
44	242.3	25.6*	266.4	25.8	268.2	26.0
48	268.3	26.0	292.6	26.2	294.5	26.3
52	294.5	26.2	318.7	26.1	321.1	26.6
56	321.0	26.5	.....	.....	.....	.....
		4)104.3		104.0		105.0
		4)26.075		26.0		26.25
		6.5187		6.5		6.5625
		6.5000				
		6.5625				
		3)19.5812				
		6.5270	Velocity with a Motive Weight of 67 lbs.			

WEDNESDAY, August 20, 1794.

Isosceles Triangle K, drawn through the water by its vertex.

Motive Weight 134 lbs.				
Accelerating Wt. 389 lbs.			Accel. Wt. 389 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	12.1	12.1	11.9	11.9
4	26.0	13.9	25.9	14.0
6	41.1	15.1	41.2	15.3
8	57.3	16.2	57.5	16.3
10	73.8	16.5	73.8	16.3
12	91.0	17.2	90.9	17.1
14	107.8	16.8	107.8	16.9
16	124.8	17.0	124.7	16.9
18	141.6	16.8	141.5	16.8
20	158.5	16.9	158.5	17.0
22	175.6	17.1	175.5	17.0
24	192.7	17.1	192.6	17.1
26	209.8	17.1	209.7	17.1
28	227.3	17.5	227.1	17.4
30	244.7	17.4	244.3	17.2
32	262.2	17.5*	261.7	17.4*
34	279.8	17.6	279.2	17.5
36	297.3	17.5	296.6	17.4
38	314.9	17.6	314.0	17.4
		4)70.2		69.7
		2)17.55		17.425
		8.7750		8.7125
		8.7125		
		2)17.4875		
Velocity with a Motive Weight of 134 lbs. .		8.7437		

WEDNESDAY, August 27, 1794. SATURDAY, August 23, 1794.

Isosceles Triangle K, drawn through the water by its vertex.

Thermometer in the Air, 60°;—In the Dock, 65½°.—Depth of Water, 11 feet 8 inches.—Strong Breeze, W.S.W.

Motive Weight 201 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	11.5	11.5	12.7	12.7
4	25.9	14.4	27.7	15.0
6	42.3	16.4	44.6	16.9
8	59.7	17.4	62.5	17.9
10	78.5	18.8	81.4	18.9
12	97.5	19.0	100.3	18.9
14	117.2	19.7	119.9	19.6
16	136.8	19.6	139.6	19.7
18	157.1	20.3	159.4	19.8
20	177.3	20.2	179.6	20.2
22	197.8	20.5	200.0	20.4
24	218.2	20.4	220.6	20.6
26	238.7	20.5*	240.9	20.3*
28	259.1	20.4	261.3	20.4
30	279.5	20.4	281.7	20.4
32	300.0	20.5	301.9	20.2
		4)81.8		81.3
		2)20.45		20.325
		10.2250		10.1625
		10.1625		
		2)20.3875		
		10.1937 Velocity with a M. W. of 201 lbs.		

Motive Weight 268 lbs.				
Accel. Wt. large ball.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	21.4	21.4	14.8	14.8
4	44.3	22.9	31.4	16.6
6	67.3	23.0	49.0	17.6
8	88.8	21.5	67.6	18.6
10	108.9	20.1	86.6	19.0
12	129.4	20.5	106.0	19.6
14	150.1	20.7	125.8	19.6
16	171.0	20.9	146.0	20.2
18	192.0	21.0	166.5	20.5
20	213.3	21.3	187.2	20.7
22	235.0	21.7	208.5	21.3
24	257.3	22.3	230.2	21.7
26	279.9	22.6	252.1	21.9
28	302.7	22.8*	274.4	22.3
30	325.8	23.1	297.3	22.9*
32	.....	.....	320.4	23.1
		2)45.9		46.0
		2)22.95		23.0
		11.475		11.5
		11.500		
		2)22.975		
		11.4875 Velocity with a Motive Weight of 268 lbs.		

WEDNESDAY, August 27, 1794.

Isosceles Triangle K, drawn through the water by its vertex.

Thermometer in the Air, 60°;—In the Dock, 65½°.—Depth of Water, 11 feet 8 inches.—Strong Breeze, W.S.W.

Motive Weight 335 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	16.0	16.0	15.6	15.6
4	34.1	18.1	33.5	17.9
6	53.5	19.4	53.0	19.5
8	73.9	20.4	73.3	20.3
10	95.0	21.1	94.3	21.0
12	116.4	21.4	115.5	21.2
14	138.4	22.0	137.4	21.9
16	160.5	22.1	159.6	22.2
18	183.3	22.8	182.6	23.0
20	206.5	23.2	205.6	23.0
22	230.2	23.7	229.3	23.7
24	253.9	23.7	253.4	24.1
26	278.9	25.0	278.5	25.1
28	304.0	25.1*	303.5	25.0*
30	330.0	26.0	329.8	26.3
		2)51.1		51.3
		2)25.55		25.65
		12.775		12.825
		12.825		
		2)25.600		
		12.800	Velocity with a Motive Weight of 335 lbs.	

Compound Figure H, having the parallelopiped end formed into a semi-ellipsis, called P, drawn through the water by its elliptical end.

Length of the semi-transverse diameter 10 feet 33 inches. Length of the conjugate diameter 3.668 feet. Angle of incidence 3° 9′ 2″.

H

	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment.....	6.6458	.....	.....	13.250	.....	.....	19.900
Hutt. Correction, or Regular Series	6.3948	.....	.....	14.499	.....	.....	19.900

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights..	.....	.....	.....	.....	.....	58.277	.....	109.38	.....	.....	.....	265.70

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.			
67 and	402	2.5967		
	804	2.2658	402..804	1.7042
				3)6.5667
			Mean 67 and 804.	2.1889

WEDNESDAY, June 25, 1794.

Compound Figure H, having the parallelopiped end formed into a semi-ellipsis, called P, drawn through the water by its elliptical end.

Thermometer in the Air, 65°;—In the Dock, 69½°.—Depth of Water, 10 feet 9 inches.—Light Breeze, East.

Total Weight 800 lbs. Motive Weight 67 lbs.						
Accel. Wt. 201 lbs.			Accel. Wt. 201 lbs.		Accel. Wt. 201 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	17.7	17.7	17.6	17.6	19.7	19.7
8	40.1	22.4	40.0	22.4	43.6	23.9
12	65.4	25.3	65.2	25.2	68.5	24.9
16	91.4	26.0	91.1	25.9	93.9	25.4
20	117.2	25.8	116.9	25.8	119.2	25.3
24	142.8	25.6	142.5	25.6	144.7	25.5
28	168.6	25.8	168.2	25.7	170.3	25.6
32	194.3	25.7	193.9	25.7	196.1	25.8
36	220.1	25.8	220.1	26.2	222.2	26.1
40	246.1	26.0	246.3	26.2	248.5	26.3
44	272.3	26.2	272.9	26.6	274.9	26.4
48	298.6	26.3*	299.7	26.8*	301.6	26.7*
52	324.9	26.3	326.5	26.8	328.2	26.6
		2)52.6		53.6		53.3
		4)26.3		26.8		26.65
		6.5750		6.7		6.6625
		7.7000				
		6.6625				
		3)19.9375				
		6.6458 Velocity with a Motive Weight of 67 lbs.				

SATURDAY, June 28, 1794.

Compound Figure H, having the parallelopiped end formed into a semi-ellipsis, called P, drawn through the water by its elliptical end.

Thermometer in the Air, 72°;—In the Dock, 73°.—Depth of Water, 11 feet 8 inches.—Light Breeze, E.S.E.

Total Weight 4973 lbs.			Motive Wt. 402 lbs.	
Accel. Wt. large ball.			A. Wt. large ball.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	22.6	22.6	22.1	22.1
4	49.0	26.4	47.9	25.8
6	76.9	27.9	75.5	27.6
8	103.5	26.6	102.2	26.7
10	129.3	25.8	128.0	25.8
12	154.5	25.2	152.8	24.8
14	179.7	25.2	177.8	25.0
16	205.1	25.4	202.9	25.1
18	230.7	25.6	228.9	26.0
20	256.7	26.0	254.6	25.7
22	283.2	26.5*	281.1	26.5*
24	309.5	26.3	307.8	26.7
		2)52.8		53.2
		2)26.4		26.6
		13.2		13.3
		13.3		
		2)26.5		
		13.25 Velocity with a Motive Weight of 402 lbs.		

WEDNESDAY, July 2, 1794.

Thermometer in the Air, 70°;—In the Dock, 69½°.—Depth of Water, 11 feet 1½ inch.—Light Breeze, North.

Total Wt. 9279 lbs.			Motive Wt. 804 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	28.2	28.2	27.7	27.7
4	60.4	32.2	59.6	31.9
6	94.6	34.2	93.7	34.1
8	129.6	35.0	128.9	35.2
10	167.0	37.4	166.0	37.1
12	204.9	37.9	204.2	38.2
14	244.5	39.6*	243.8	39.6*
16	284.3	39.8	284.0	40.2
		2)79.4		79.8
		2)39.7		39.9
		19.85		19.95
		19.95		
		2)39.80		
		19.90 Velocity with a Motive Weight of 804 lbs.		

Compound Figure H, having the parallelopiped end reduced to two segments of a circle, called Q, drawn through the water by its circular end.

Half length of the chord, 10.33 feet. Versed sine, 1.834 feet. Angle of incidence 3° 9′ 2″.

H

	Motive Weights.						
	67	134	268	402	536	670	804
Velocity per Experiment	7.4437	.....	.....	14.119	.....	.....	.....
Hutt. Correction, or Regular Series	7.4437	.....	.....	14.119	.....	.....	.....

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12
Motive Weights ..	.....	.....	.....	.....	.....	36.642	.....	.....	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

$$\left|\begin{matrix}\text{lbs.}\\67\end{matrix}\text{ and }\begin{matrix}\text{lbs.}\\402\end{matrix}\right|\ \underline{2.7990}\ \Big| = 67\ ..\ 402.$$

SATURDAY, July 5, 1794.

Compound Figure H, having the parallelopiped end reduced to two segments of a circle, called Q, drawn through the water by its circular end.

Thermometer in the Air, 71°;—In the Dock, 72°.—Depth of Water, 10 feet 3 inches.—Fresh Breeze, E. S. E.

Total Weight 778 lbs. Motive Weight 67 lbs.				
Accelerating Wt. 437 lbs.			Accel. Wt. 437 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	20.1	20.1	20.2	20.2
8	45.1	25.0	45.2	25.4
12	73.0	27.9	73.2	28.0
16	103.1	30.1	102.9	29.7
20	133.2	30.1	132.7	29.8
24	163.1	29.9	162.3	29.6
28	192.5	29.4	191.6	29.3
32	221.9	29.4	220.7	29.1
36	251.5	29.6	250.0	29.3
40	281.4	29.9*	279.6	29.6*
44	312.3	29.9	309.3	29.7
		2)59.8		59.3
		4)29.9		29.65
		7.4750		7.4125
		7.4125		
		2)14.8875		
Velocity with a Motive Weight of 67 lbs..		7.4437		

SATURDAY, July 12, 1794.

Compound Figure H, having the parallelopipedon end reduced to two segments of a circle, called Q, drawn through the water by its circular end.

Thermometer in the Air, 71½°;—In the Dock, 73°.—Depth of Water 10 feet 9 inches.—Light Breeze, East.

Total Weight 5018¼ lbs. Motive Weight 402 lbs.

	Accelerating Wt. none.		A. Wt. large ball.		A. Wt. large ball.		A. Wt. large ball.	
Sec	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	19.0	19.0	23.4	23.4	23.5	23.5	23.2	23.2
4	41.4	22.4	51.0	27.6	51.1	27.6	50.4	27.2
6	65.3	23.9	80.2	29.2	80.5	29.4	79.2	28.8
8	89.6	24.3	110.4	30.2	110.2	29.7	109.5	30.3
10	114.8	25.2	139.6	29.2	139.6	29.4	138.6	29.1
12	140.0	25.5†	168.0	28.4	168.0	28.4	167.0	28.4
14	166.5	26.2‡	195.8	27.8	195.9	27.9	194.8	27.8
16	192.7	26.2	223.6	27.8	223.7	27.8	223.2	28.4
18	219.9	27.2	251.2	27.6	251.8	28.1	251.3	28.1
20	247.2	27.3	279.2	28.0*	279.9	28.1*	279.8	28.5*
22	275.6	28.4*	307.4	28.2	308.1	28.2	308.2	28.4
24	303.7	28.1	.....	.....	.....	.....	.....	.....
		2)56.5		56.2		56.3		56.9
		2)28.25		28.1		28.15		28.45
		14.125		14.050		14.075		14.225
				14.125				
				14.075				
				14.225				
				4)56.475				
				14.119				

Velocity with a Motive Weight of 402 lbs. . 14.119

† Query 25.2?

‡ Query 26.5?

GENERAL TABLE, 1794.

	Page.	Feet per Second.											
		1	2	3	4	5	6	7	8	9	10	11	12
Parallelopipedon D	48	.....	.....	.....	.....	.....	342.38	.....	.....	.....	.....	.....	.....
..... E	51	.....	40.787	.....	163.75	.....	369.27	.....	657.55	.....	.....	.....	1482.8
..... F	55	2.7774	15.941	44.312	91.522	160.65	254.41	375.26	525.50	707.22	922.44	1173.0	1460.8
Triangle K, Base foremost.....	59	2.6738	12.866	32.253	61.909	102.67	155.20	220.11	297.91	389.08	494.02	613.15	748.84
Triangle K, Vertex foremost..	62	1.2348	5.6652	13.811	25.990	42.442	63.362	88.913	119.24	154.49	194.74	240.11	290.70
Compound H, called P.....	67	.....	.....	.....	.....	.....	58.277	.....	109.38	.....	.....	.....	265.70
..... Q	70	.....	.....	.....	.....	.....	36.642	.....	.....	.....	.....	.....	.....

Parallelopipedon a. Length 42.198 feet. Depth 1.219 feet. Breadth 1.219 feet. Area of the end 1.4859 feet.

a

	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment	.....	1.0124	1.4830	2.1583	3.0500	4.2749	5.950	7.2000	8.3556
Hutt. Correction, or Regular Series	.....	1.0502	1.4858	2.1018	2.9733	4.2061	5.950	7.2885	8.4170

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.8983	7.5840	17.052	30.300	47.327	68.129	92.708	121.09	153.19	189.07	228.75	272.20	345.81
Motive Weights of Parallelopipedon b. ...	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Friction on 77.16 feet....	0.6132	1.9474	3.667	5.577	7.532	9.419	11.142	12.64	13.78	14.52	14.82	14.69	13.34

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz. drs.	lbs. oz.																					
2 1 8 and	4 3	1.8157																				
	8 6	1.8314	4 3..	8 6	1.8472																	
	16 12	1.8856		16 12	1.9225	8 6..	16 12	2.0043														
	33 8	1.9248		33 8	1.9642		33 8	2.0284	16 12..	33 8	2.0530											
	67 0	1.9570		67 0	1.9956		67 0	2.0506		67 0	2.0745	33 8..	67 0	2.0964								
	100 8	1.9733		100 8	2.0114		100 8	2.0626		100 8	2.0860		100 8	2.1073	67..	100 8	2.1263					
	134 0	1.9705		134 0	2.0046		134 0	2.0483		134 0	2.0634		134 0	2.0686		134 0	2.0461	100 8..	134	1.9327		

28)55.9523

Mean 4 lbs. 3 oz. and 67 lbs..... 1.9983

TUESDAY, July 7, 1795.

Parallelopipedon a.

Thermometer in the Air, 59½°;—In the Dock, 62½.—Light Breeze, N.

Motive Weight 2 lbs. 1 oz. 8 drs.						
Accelerating Wt. 2 lbs.			Accel. Wt. 2 lbs.		Accel. Wt. 2 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
8	1.9	1.9	1.8	1.8	1.9	1.9
16	5.3	3.4	5.1	3.3	5.2	3.3
24	9.9	4.6	9.7	4.6	9.7	4.5
32	15.7	5.8	15.4	5.7	15.4	5.7
40	22.3	6.6	22.0	6.6	21.9	6.5
48	29.6	7.3	29.2	7.2	29.1	7.2
56	37.2	7.6	36.7	7.5	36.8	7.7
64	45.4	7.8	44.5	7.8	44.6	7.8
72	52.8	7.8	52.3	7.8	52.5	7.9
80	60.8	8.0	60.3	8.0	60.5	8.0
88	68.8	8.0	68.3	8.0	68.6	8.1
96	76.7	7.9	76.3	8.0	76.7	8.1
104	85.0	8.3	84.4	8.1	84.9	8.2
112	93.0	8.0	92.6	8.2	93.0	8.1
		3)24.2		24.3		24.4
		8)8.0666		8.1		8.1333
		1.0083		1.0125		1.0166
		1.0125				
		1.0166				
		3)3.0374				
		1.0124 Velocity with a Motive Weight of 2 lbs. 1 oz. 8 drs.				

TUESDAY, July 7, 1795.

Parallelopipedon a.

Motive Weight 4lbs. 3 oz.

Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.		Accel. Wt. 4 lbs.		Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	1.3	1.3	1.2	1.2	1.5	1.5	1.3	1.3
8	3.5	2.2	3.7	2.5	3.7	2.2	3.4	2.1
12	6.3	2.8	6.7	3.0	6.6	2.9	6.2	2.8
16	9.8	3.5	10.4	3.7	10.1	3.5	9.6	3.4
20	13.9	4.1	14.6	4.2	14.2	4.1	13.6	4.0
24	18.4	4.5	19.3	4.7	18.8	4.6	18.1	4.5
28	23.3	4.9	24.4	5.1	23.7	4.9	23.0	4.9
32	28.4	5.1	29.5	5.1	28.8	5.1	28.0	5.0
36	33.8	5.4	35.0	5.5	34.3	5.5	33.4	5.4
40	39.4	5.6	40.6	5.6	39.8	5.5	39.0	5.6
44	45.0	5.6	46.2	5.6	45.3	5.5	44.5	5.5
48	50.8	5.8	51.9	5.7	51.0	5.7	50.1	5.6
52	56.7	5.9	57.6	5.7	56.6	5.6	55.9	5.8
56	62.3	5.6	63.5	5.9	62.4	5.8	61.6	5.7
60	68.2	5.9	69.3	5.8	68.2	5.8	67.5	5.9
64	74.1	5.9	75.2	5.9*	74.2	6.0*	73.4	5.9*
68	80.1	6.0*	81.1	5.9	80.1	5.9	79.3	5.9
72	86.1	6.0	87.0	5.9	86.0	5.9	85.2	5.9
76	92.1	6.0						
		3)18.0		17.7		17.8		17.7
		4)6.0		5.9		5.933		5.9
		1.5		1.475		1.483		1.475
				1.500				
				1.483				
				1.475				
				4)5.933				
				1.483	Velocity with a Motive Weight of 4 lbs. 3 oz.			

TUESDAY, July 7, 1795.

Parallelopipedon a.

Motive Weight 8 lbs. 6 oz.				
Accelerating Wt. 8 lbs.			Accel. Wt. 8 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	1.5	1.5	1.7	1.7
8	4.5	3.0	5.0	3.3
12	8.8	4.3	9.5	4.5
16	14.3	5.5	15.2	5.7
20	20.8	6.5	21.9	6.7
24	28.1	7.3	29.5	7.6
28	36.1	8.0	37.5	8.0
32	44.3	8.2	45.9	8.4
36	52.7	8.4	54.3	8.4
40	61.2	8.5	63.0	8.7
44	69.8	8.6*	71.6	8.6*
48	78.4	8.6	80.3	8.7
52	87.1	8.7	88.9	8.6
		3)25.9		25.9
		4)8.6333		8.6333
		2.1583		2.1583
		2.1583		
		2)4.3166		
		2.1583 Velocity with a Motive Weight of 8 lbs. 6 oz.		

By experiments made December 1, 1795, (when the System of Pullies was three-fold, the Motive Weight 8 lbs. 6 oz.—the Total Weight 26 lbs.—Accelerating Weight 7 lbs.—and the space run through 127.2 feet) the Velocity was 2.1937 feet per second.

The preceding experiments with Parallelopipedon a, were made with a two-fold System.

TUESDAY, December 1, 1795.

Parallelopipedon a.

Thermometer in the Dock, 43°.—Fresh Breeze, S. W.

Total Wt. 51 lbs. 8 oz.			M. W. 16 lbs. 12 oz.	
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.7	2.7	3.6	3.6
8	7.8	5.1	9.4	5.8
12	14.9	7.1	17.2	7.8
16	23.8	8.9	26.5	9.3
20	33.9	10.1	36.9	10.4
24	45.1	11.2	48.3	11.4
28	56.8	11.7	59.9	11.6
32	68.7	11.9	71.9	12.0
36	80.7	12.0	83.9	12.0
40†	86.7	6.0	90.0	6.1
40	92.7	6.0	96.0	6.0
42	98.8	6.1	102.2	6.2*
44	104.9	6.1	108.3	6.1
46	111.0	6.1*	114.4	6.1
48	117.0	6.0	120.5	6.1
50	123.2	6.2	.....	.....
52	129.2	6.0	.....	.....
		4)24.3		24.5
		2)6.075		6.125
		3.0375		3.0625
		3.0625		
		2)6.1000		
		3.05 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

† Query 38?

SATURDAY, July 25, 1795.

Thermometer in the Air, 58°.—Light Airs, Easterly.

System Two-fold.

Total Wt. 67 lbs. 11 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 42 lbs.			Accel. Wt. 42 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.2	1.2	1.1	1.1
4	4.3	3.1	4.1	3.0
6	8.7	4.4	8.8	4.7
8	14.4	5.7	14.5	5.7
10	21.3	6.9	21.5	7.0
12	29.1	7.8	28.7	7.2
14	36.9	7.8	37.0	8.3
16	45.1	8.2	45.2	8.2
18	53.5	8.4	53.6	8.4
20	62.2	8.7	62.1	8.5
22	70.8	8.6*	70.7	8.6*
24	79.3	8.5	79.2	8.5
26	87.9	8.6	87.7	8.5
		3)25.7		25.6
		2)8.5666		8.5333
		4.2833		4.2666
		4.2666		
		2)8.5499		
		4.2749 Velocity with a Motive Wt. of 33 lbs. 8 oz. ‡		

‡ By experiments made December 1, 1795, with a Motive Weight of 33 lbs. 8 oz. (the Total Weight, 102 lbs. 8 oz.—Accelerating Weight, 28 lbs., and the space run through 121 feet) the Velocity was 4.325 feet per second.

TUESDAY, December 1, 1795.

Parallelopipedon a.

Thermometer in the Dock, 43°.—Fresh Breeze, S.W.
System Three-fold.

Total Weight 207 lbs. Motive Weight 67 lbs.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.5	3.5	3.4	3.4
4	9.4	6.9	9.3	5.9
6	17.2	7.8	17.0	7.7
8	26.6	9.4	26.4	9.4
10	36.9	10.3	36.9	10.5
12	47.7	10.8	48.2	11.3
14	58.8	11.1	59.8	11.6
16	70.3	11.5	71.5	11.7
18	81.7	11.4	83.4	11.9
20	93.4	11.7	95.3	11.9
22	105.2	11.8	107.2	11.9
24	117.1	11.9*	119.1	11.9*
		2)11.9		11.9
		5.95		5.95
		5.95		
		2)11.90		
		5.95 Velocity with a M. Wt. of 67 lbs.†		

Thermometer in the Dock, 43°.—Fresh Breeze, S.W.
System Three-fold.

Total Wt. 307 lbs. 8 oz. M. W. 100 lbs. 8 oz.				
Accel. Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.1	4.1	4.8	4.8
4	11.5	7.4	12.6	7.8
6	21.4	9.9	23.1	10.5
8	33.3	11.9	35.3	12.2
10	46.3	13.0	48.6	13.3
12	60.0	13.7	62.3	13.7
14	73.9	13.9	76.3	14.0
16	88.1	14.2	90.4	14.1
18	102.5	14.4*	104.8	14.4*
20	116.9	14.4	119.2	14.4
		2)28.8		28.8
		2)14.4		14.4
		7.2		7.2
		7.2		
		2)14.4		
		7.2 Velocity with a M. Wt. of 100 lbs. 8 oz.		

† By experiments made July 25, 1795, with a Motive Weight of 67 lbs. (and the space run through 320.3 feet) the Velocity was 5.933 feet per second,—System of Pullies in this case was Ten-fold.

TUESDAY, July 14, 1795.

Parallelopipedon a.

Thermometer in the Air, 63½°;—In the Dock, 63°.—Light Breeze, Northerly.

System Tenfold.

Total Wt. 1485 lbs. Motive Wt. 134 lbs. T.W. 1473 lbs. M.W. 134 lbs.

Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	10.2	10.2	9.9	9.9	8.4	8.4
4	22.1	11.9	21.6	11.7	19.3	10.9
6	35.2	13.1	34.7	13.1	31.6	12.3
8	49.2	14.0	48.4	13.7	45.2	13.6
10	63.6	14.4	62.7	14.3	69.3	14.1
12	78.5	14.9	77.7	15.0	74.1	14.8
14	93.9	15.4	92.9	15.2	89.2	15.1
16	109.3	15.4	108.3	15.4	104.4	15.2
18	124.9	15.6	124.0	15.7	119.8	15.4
20	140.7	15.8	139.8	15.8	135.5	15.7
22	156.5	15.8	155.7	15.9	151.4	15.9
24	172.6	16.1	171.8	16.1	167.4	16.0
26	188.5	15.9	187.8	16.0	183.5	16.1
28	204.8	16.3	204.1	16.3	199.8	16.3
30	221.2	16.4	220.5	16.4	216.2	16.4
32	237.5	16.3	237.0	16.5	232.7	16.5
34	254.3	16.8	253.6	16.6	249.2	16.5
36	270.9	16.6	270.3	16.7	265.9	16.7*
38	287.8	16.9*	287.0	16.7*	282.5	16.6
40	304.5	16.7	303.6	16.6	299.0	16.5
42	321.4	16.9	320.4	16.8	315.6	16.6
		3)50.5		50.1		4)66.4
		2)16.8333		16.7		16.6
		8.4167		8.35		8.3†
		8.3500				
		8.3000				
		3)25.0667				
		8.3556 Velocity with a Motive Weight of 134 lbs.				

† The third experiment was made July 24, 1795.

Parallelopipedon b. Length 21.099 feet. Breadth 1.219 feet. Depth 1.219 feet. Area of the end 1.4859 feet.

Half the length of a.

b

	Motive Weights.													
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment.....	.....	.....	1.7083	2.3500	3.3312	4.7125	6.3833	7.766	8.7207
Hutt. Correction, or Regular Series.....		1.2571	1.7399	2.4080	3.3326	4.6123	6.3833	7.7197	8.8344

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.		lbs. oz.																					
4	3 and	8	6	2.1735																			
		16	12	2.0758	8	6..	16	12	1.9866														
		33	8	2.0493			33	8	1.9924	16	12..	33	8	1.9982									
		67	0	2.1033			67	0	2.0809			67	0	2.1317	33	8..	67	0	2.2842					
		100	8	2.0988			100	8	2.0788			100	8	2.1169			100	8	2.1992	67..	100	8	2.0679	
		134	0	2.1259			134	0	2.1144			134	0	2.1607			134	0	2.2524		134	0	2.2215	100 8.. 134	2.4812

21)44.7936

Mean 16 lbs. 12 oz. and 67 lbs.. . 2.1330

Digitized by Google

SATURDAY, August 29, 1795.

Parallelopipedon b.

Thermometer in the Air, 62½°;—In the Dock, 68°.—Calm.

System Two-fold.

Motive Weight, 4 lbs. 3 oz.				
Accelerating Wt. 1 lb.			Accel. Wt. 1 lb.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.9	1.9	1.3	1.3
4	3.2	1.3	2.7	1.4
6	4.8	1.6	4.5	1.8
8	6.6	2.2	5.9	1.4
10	8.6	2.0	8.3	2.4
12	10.7	2.1	10.4	2.1
14	13.1	2.4	12.8	2.4
16	15.5	2.4	15.3	2.5
18	18.0	2.5	18.0	2.7
20	20.7	2.7	20.8	2.8
22	23.5	2.8	23.5	2.7
24	26.4	2.9	26.4	2.9
26	29.4	3.0	29.3	2.9
28	32.4	3.0	32.4	3.1
30	35.4	3.0	35.5	3.1
32	38.5	3.1	38.6	3.1
34	41.6	3.1	41.8	3.2
36	44.9	3.3	45.1	3.3
38	48.2	3.3	48.3	3.2
40	51.4	3.2	51.6	3.3
42	54.5	3.1	54.8	3.2
44	58.0	3.5	58.1	3.3
46	61.0	3.3	61.4	3.3
48	64.7	3.4	64.7	3.3
50	68.1	3.4	68.0	3.3
52	71.5	3.4	71.3	3.3
54	74.9	3.4	74.6	3.3
56	78.3	3.4	78.0	3.4*
58	81.7	3.4*	81.4	3.4
60	85.2	3.5	84.8	3.4
62	88.6	3.4	.....	.....
		3)10.3		10.2
		3.4333		3.4
		3.4000		
		2)6.8333		
		2)3.4166		
		1.7083	Velocity with a Motive Weight of 4 lbs. 3 oz.	

SATURDAY, August 29, 1795.

Parallelopipedon b.

System Two-fold.

Motive Weight 8 lbs. 6 oz.				
Accelerating Wt. 2 lbs.			Accel. Wt. 2 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.8	1.8	1.3	1.3
4	4.1	2.3	3.1	1.8
6	6.8	2.7	5.4	2.3
8	9.8	3.0	8.2	2.8
10	13.3	3.5	11.2	3.0
12	16.9	3.6	14.6	3.4
14	20.8	3.9	18.3	3.7
16	24.7	3.9	22.0	3.7
18	28.9	4.2	26.0	4.0
20	33.2	4.3	30.2	4.2
22	37.4	4.2	34.4	4.2
24	41.8	4.4	38.8	4.4
26	46.3	4.5	43.2	4.4
28	50.8	4.5	47.7	4.5
30	55.4	4.6	52.2	4.5
32	60.0	4.6	56.8	4.6
34	64.7	4.7	61.4	4.6
36	69.3	4.6	66.0	4.6
38	74.0	4.7*	70.7	4.7*
40	78.7	4.7	75.4	4.7
42	83.4	4.7	80.1	4.7
44	.....	.....	84.8	4.7

3)14.1 — 4)18.8

2)4.7 — 4.7

2.35 — 2.35

2.35

2)4.70

2.35 Velocity with a Motive Weight of 8 lbs. 6 oz.

THURSDAY, November 26, 1795.

Parallepipedon b.

Thermometer in the Air, 36°;—In the Dock, 41°.
—Moderate Breeze, W.N.W.

System Three-fold.

Total Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.

Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.7	4.7	5.7	5.7
8	13.0	8.3	16.7	9.0
12	23.6	10.6	28.3	11.6
16	35.6	12.0	41.0	12.7
20	48.6	13.0	54.2	13.2
24	61.9	13.3	67.6	13.4
28	75.2	13.3	80.9	13.3
32	88.4	13.2	94.3	13.4
36	101.7	13.3	101.0	6.7
38	108.3	6.6*	107.7	6.7*
40	115.0	6.7	114.4	6.7
42	121.6	6.6	121.1	6.7
44	128.3	6.7	127.7	6.6
		4)26.6		26.7
		2)6.65		6.675
		3.3250		3.3375
		3.3375		
		2)6.6625		
		3.3312 Velocity with a M. Wt of 16 lbs. 12 oz.		

System Three-fold.

Total Wt. 102 lbs. 8 oz. M. Wt. 33 lbs. 8 oz.

Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.0	3.0	3.1	3.1
4	7.9	4.9	8.0	4.9
6	14.1	6.2	14.4	6.4
8	21.5	7.4	21.7	7.3
10	29.6	8.1	30.0	8.3
12	38.2	8.6	38.6	8.6
14	47.1	8.9	47.6	9.0
16	56.4	9.3	56.8	9.2
18	65.6	9.2	66.0	9.2
20	74.9	9.3	75.4	9.4
22	84.3	9.4	84.8	9.4
24	93.6	9.3	94.2	9.4
26	103.0	9.4*	103.7	9.5*
28	112.4	9.4	113.1	9.4
30	121.7	9.3	122.6	9.5
32	131.1	9.4	132.1	9.5
		4)37.5		37.9
		2)9.375		9.475
		4.6875		4.7375
		4.7375		
		2)9.4250		
		4.7125 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

THURSDAY, November 26, 1795.

Parallelopipedon b.

System Three-fold.

Total Weight 207 lbs. Motive Weight 67 lbs.						
Accelerating Wt. 28 lbs.			A. Wt. 28 lbs.		A. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.5	7.5	5.1	5.1	5.6	5.6
4	17.9	10.4	13.6	8.5	14.5	8.9
6	29.5	11.6	24.4	10.8	25.4	10.9
8	41.8	12.3	36.2	11.8	37.3	11.9
10	54.2	12.4	48.7	12.5	59.6	12.3
12	66.5	12.3	61.2	12.5	62.0	12.4
14	78.9	12.4	73.7	12.5	74.5	12.5
16	91.5	12.6	86.2	12.5	86.9	12.4
18	104.2	12.7	98.9	12.7	99.5	12.6
20	117.0	12.8*	111.6	12.7*	112.3	12.8*
22	129.8	12.8	124.4	12.8	125.0	12.7
		2)25.6		25.5		25.5
		2)12.8		12.75		12.75
		6.400		6.375		6.375
		6.375				
		6.375				
		3)19.150				
		6.3833	Velocity with a Motive Weight of 67 lbs.			

THURSDAY, November 26, 1795.

TUESDAY, August 25, 1795.

Parallelopipedon b.

Thermometer in the Air, 71°;—In the Dock, 70°.
—Nearly calm.

System Three-fold.

Total Wt. 307 lbs. 8 oz. M. Wt. 100 lbs. 8 oz.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.0	8.0	7.9	7.9
4	20.5	12.5	20.5	12.6
6	35.3	14.8	35.3	14.8
8	51.2	15.9	51.3	16.0
10	67.0	15.8	66.9	15.6
12	82.5	15.5	82.2	15.3
14	98.0	15.5*	97.6	15.4*
16	113.5	15.5	113.2	15.6
18	129.2	15.7	128.7	15.5
		3)46.7		46.5
		2)15.566		15.5
		7.783		7.75
		7.750		
		2)15.533		
		7.766 Velocity with a M. Wt. of 100 lbs. 8 oz.		

System Ten-fold.

Motive Weight 134 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences
2	11.6	11.6	10.6	10.6
4	26.1	14.5	24.5	13.9
6	41.8	15.7	40.2	15.7
8	50.4	16.6	56.6	16.4
10	75.2	16.8	73.4	16.8
12	92.6	17.4	90.7	17.3
14	109.8	17.2	108.1	17.4*
16	127.2	17.4*	125.4	17.3
18	144.7	17.5	143.0	17.6
		2)34.9		3)52.3
		2)17.45		17.433
		8.7250		8.716
		8.7165		
		2)17.4415		
		8.7207 Velocity with a Motive Wt. of 134 lbs.		

Parallelopipedon b, lengthened by adding a semi-ellipsis to its hindmost extremity, called c.

Length of the semi-ellipsis 3.6058 feet. Breadth 1.219 feet. Depth 1.219 feet.

	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment			1.7187	2.4062	3.5375	4.8333	6.4583	7.6833	8.9083
Hutt. Correction, or Regular Series	1.2854		1.7750	2.4508	3.3839	4.6725	6.4517	7.7917	8.9083

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.2207	5.4117	12.932	23.991	38.749	57.326	79.836	106.36	136.98	171.78	210.81	254.14	328.72
Parallelopipedon b	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Diminution of the minus pressure by body c.	0.0644	0.2249	0.453	0.732	1.046	1.384	1.730	2.09	2.43	2.77	3.12	3.37	3.75

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
4 3 and 8 6	2.0600							
16 12	1.9205	8 6..16 12	1.7987					
33 8	2.0112	33 8	1.9876	16 12..33 8	2.2203			
67 0	2.0944	67 0	2.1061	67 0	2.3031	33 8..67 0	2.3916	
100 8	2.1222	100 8	2.1403	108 8	2.3101	100 8	2.3702	67..108 8 2.3345
134 0	2.1062	134 0	2.1182	134 0	2.2515	134 0	2.2672	134 0 2.1551

100 8..134 1.9447

21)45.0142

Mean 67 lbs. and 134 lbs.. . 2.1483

SATURDAY, August 29, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its hindmost extremity, called c.

Thermometer in the Air, 62½°;—In the Dock, 68°.—Calm.

System Two-fold.

Motive Weight 4 lbs. 3 oz.				
Accelerating Wt. 1 lb.			Accel. Wt. 1 lb.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.2	1.2	1.3	1.3
4	2.8	1.6	3.0	1.7
6	4.6	1.8	4.8	1.8
8	6.5	1.9	6.8	2.0
10	8.7	2.2	9.0	2.2
12	11.1	2.4	11.3	2.3
14	13.4	2.3	13.8	2.5
16	16.1	2.7	16.5	2.7
18	18.8	2.7	19.2	2.7
20	21.6	2.8	22.1	2.9
22	24.5	2.9	25.0	2.9
24	27.5	3.0	28.0	3.0
26	30.6	3.1	31.0†	3.1
28	33.7	3.1	34.2	3.1
30	36.8	3.1	37.3	3.1
32	40.1	3.3	40.5	3.2
34	43.3	3.2	43.8	3.3
36	46.6	3.3	47.1	3.3
38	49.9	3.3	50.5	3.4
40	53.2	3.3	53.8	3.3
42	56.5	3.3	57.2	3.4
44	60.0	3.5	60.6	3.4
46	63.3	3.3	64.0	3.4
48	66.7	3.4	67.4	3.4
50	70.2	3.5	70.9	3.5
52	73.6	3.4	74.3	3.4*
54	77.0	3.4*	77.8	3.5
56	80.4	3.4	81.2	3.4
58	83.9	3.5	84.7	3.5
60	87.3	3.4	.....	.....
		4)13.7		13.8
		2)3.425		3.45
		1.7125		1.725
		1.7250		
		2)3.4375		
		1.7187 Velocity with a Motive Weight of 4 lbs. 3 oz.		

† Query 31.1?

SATURDAY, August 29, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its hindmost extremity, called e.

System Two-fold.

Motive Weight 8 lbs. 6 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.0	2.0	1.3	1.3
4	4.3	2.3	3.2	1.9
6	7.0	2.7	5.4	2.2
8	10.0	3.0	8.0	2.6
10	13.2	3.2	10.9	2.9
12	16.8	3.6	14.0	3.1
14	20.6	3.8	17.5	3.5
16	24.4	3.8	21.1	3.6
18	28.5	4.1	24.9	3.8
20	32.8	4.3	29.0	4.1
22	37.0	4.2	33.1	4.1
24	41.0	4.5	37.4	4.3
26	46.1	4.6	41.7	4.3
28	50.7	4.6	46.3	4.6
30	55.4	4.7	50.8	4.5
32	60.2	4.8*	55.4	4.6
34	65.0	4.8	60.2	4.8
36	69.9	4.9	64.9	4.7
38	74.6	4.7	69.7	4.8*
40	.....	.....	74.5	4.8
42	.....	.....	79.4	4.9
44	.....	.....	84.2	4.8
		4)19.2		19.3
		2)4.8		4.825
		2.4000		2.4125
		2.4125		
		2)4.8125		
		2.4062 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

System Two-fold.

Total Wt. 34 lbs. Motive Wt. 16 lbs. 12 oz.				
Accelerating Wt. 32 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.4	4.4	3.9	3.9
4	10.1	5.7	9.2	5.3
6	16.6	6.5	15.4	6.2
8	24.1	7.5	22.5	7.1
10	31.0	6.9	29.4	6.9
12	38.4	7.4	36.4	7.0
14	45.6	7.2	43.7	7.3
16	52.8	7.2	50.8	7.1
18	59.8	7.0	57.8	7.0
20	67.0	7.2	65.0	7.2
22	74.1	7.1	72.0	7.0
24	81.1	7.0*	79.1	7.1*
26	88.2	7.1	86.2	7.1
		2)14.1		14.2
		2)7.05		7.1
		3.525		3.55
		3.550		
		2)7.075		
		3.5375 Velocity with a Motive Weight of 16 lbs. 12 oz.		

FRIDAY, August 28, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its hindmost extremity, called c.

Thermometer in the Air, 62°;—In the Dock, 68°.—Moderate Breeze, N. W.

System Two-fold.

Total Weight 67 lbs. 10 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.8	6.8	4.0	4.0	4.5	4.5
4	14.8	8.0	10.0	6.0	10.8	6.3
6	23.7	8.9	17.3	7.3	18.5	7.7
8	33.1	9.4	25.8	8.5	27.0	8.5
10	42.8	9.7	35.0	9.2	36.4	9.4
12	52.3	9.5*	44.4	9.4	45.9	9.5
14	62.0	9.7	53.9	9.5	55.4	9.5
16	71.8	9.8	63.7	9.8*	65.0	9.6*
18	.....	.....	73.3	9.6	74.7	9.7
20	.....	.....	83.0	9.7	84.3	9.6
		3)29.0		29.1		28.9
		2)9.666		9.7		9.633
		4.833		4.85		4.816
		4.850				
		4.816				
		3)14.499				
		4.8333 Velocity with a Motive Weight of 33 lbs. 8 oz.				

TUESDAY, August 25, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its hindmost extremity, called c.

Thermometer in the Air, 71°;—In the Dock, 70°.—Almost calm.

System Ten-fold.

Total Weight 765 lbs. Motive Weight 67 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.4	6.4	7.8	7.8	7.3	7.3
4	14.9	8.5	17.4	9.6	16.3	9.0
6	24.9	10.0	28.2	10.8	26.6	10.3
8	35.6	10.7	39.3	11.1	37.7	11.1
10	47.2	11.6	51.2	11.9	49.6	11.9
12	59.1	11.9	63.4	12.2	61.5	11.9
14	71.3	12.2	75.7	12.3	73.8	12.3
16	83.8	12.5	88.3	12.6	86.4	12.6
18	96.5	12.7	109·7	12.4	98.9	12.5
20	109.2	12.7	113.3	12.6	111.6	12.7
22	122.1	12.9	125.9	12.6	124.2	12.6
24	135.0	12.9*	138.9	12.9*	136.9	12.7*
26	148.1	13.1	151.8	13.0	149.8	12.9
		2)26.0		25.9		25.6
		2)13.0		12.95		12.8
		6.500		6.475		6.4
		6.475				
		6.400				
		3)19.375				
		6.4583 Velocity with a Motive Weight of 67 lbs.				

FRIDAY, August 28, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its hindmost extremity, called c.

Thermometer in the Air, 62°;—In the Dock, 68°.—Moderate Breeze, N.W.

System Ten-fold.

Total Wt. 1052 lbs. Motive Wt. 100 lbs. 8 oz.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	11.7	11.7	9.4	9.4
4	25.1	13.4	21.4	12.0
6	39.0	13.9	34.7	13.3
8	53.3	14.3	49.0	14.3
10	67.7	14.4	63.2	14.2
12	82.7	15.0	78.0	14.8
14	97.8	15.1	93.0	15.0
16	113.2	15.4*	108.4	15.4
18	128.4	15.2	123.6	15.2*
20	143.9	15.5	139.2	15.6
22	.....	.....	154.5	15.3
		3)46.1		46.1
		2)15.3666		15.3666
		7.6833		7.6833
		7.6833		
		2)15.3666		
		7.6833 Velocity with a M. Wt. of 100 lbs. 8 oz.		

TUESDAY, August 25, 1795.

Thermometer in the Air, 71°;—In the Dock, 70°. Almost calm.

System Ten-fold.

Motive Weight 134 lbs.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	13.0	13.0	12.9	12.9
4	28.4	15.4	28.1	15.2
6	44.9	16.5	44.4	16.3
8	61.8	16.9	61.3	16.9
10	79.3	17.5	78.8	17.5
12	97.2	17.9	96.6	17.8
14	115.0	17.8*	114.3	17.7
16	132.8	17.8	132.2	17.9
18	150.7	17.9	.....	.....
		3)53.5		2)35.6
		2)17.833		17.8
		8.9166		8.9
		8.9000		
		2)17.8166		
		8.9083 Velocity with a M. Wt. of 134 lbs.		

Parallelopipedon b, lengthened by adding a semi-ellipsis to its foremost extremity, called d.

Length of the semi-ellipsis 3.6058 feet.

	Motive Weights.																	
	lbs. 1	oz. drs. 0 12	lbs. 2	oz. drs. 1 8	lbs. 4	oz. 3	lbs. 8	oz. 6	lbs. 16	oz. 12	lbs. 33	oz. 8	lbs. 67	oz. 0	lbs. 100	oz. 8	lbs. 134	oz. 0
Velocity per Experiment.....	.....		.....		2.2333		3.0666		4.5583		6.0750		8.1000		10.0375		11.850	
Hutt. Correction, or Regular Series.....			1.5883		2.2095		3.0736		4.2759		5.9484		8.2749		10.0375		11.511	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.7926	3.3972	7.9595	14.561	23.263	34.114*	47.152	62.412	79.924	99.714	121.81	146.23	188.05
Parallelopipedon b.....	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Diminution of the plus pressure by body d.	0.4925	2.2394	5.426	10.162	16.532	22.596	34.414	46.04	59.49	74.84	92.12	111.28	144.42

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.																							
4	3	and	8	6	2.1860																						
	16		12	1.9430	8	6..	16	12	1.7488																		
	33		8	2.0780			33	8	2.0279	16	12..	33	8	2.4132													
	67		0	2.1520			67	0	2.1409			67	0	2.4113	33	8..	67	0	2.4094								
	100		8	2.1147			100	8	2.0957			100	8	2.2699			100	8	2.1878	67..	100	8	1.8906				
	134		0	2.0766			134	0	2.0511			134	0	2.1766			134	0	2.0749		134	0	1.8219	100	8..	134	1.7331

21) 44.0034

Mean 8 lbs. 6 oz. and 100 lbs. 8 oz... 2.0997

* Should be 36.114?

SATURDAY, August 29, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its foremost extremity, called d.

Thermometer in the Air, 62½°;—In the Dock, 68.—Calm.

System Two-fold.

Motive Weight 4 lbs. 3 oz.				
Accelerating Wt. 1 lb.			Accel. Wt. 1 lb.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.3	1.3	1.2	1.2
4	2.9	1.6	2.6	1.4
6	4.7	1.8	4.2	1.6
8	6.8	2.1	6.0	1.8
10	9.0	2.2	8.0	2.0
12	11.3	2.3	10.4	2.4
14	14.0	2.7	13.0	2.6
16	16.8	2.8	15.6	2.6
18	19.7	2.9	18.5	2.9
20	22.8	3.1	21.5	3.0
22	26.1	3.3	24.7	3.2
24	29.5	3.4	28.1	3.4
26	33.0	3.5	31.5	3.4
28	36.6	3.6	35.1	3.6
30	40.3	3.7	38.9	3.8
32	44.1	3.8	42.7	3.8
34	48.0	3.9	46.6	3.9
36	52.0	4.0	50.6	4.0
38	56.1	4.1	54.7	4.1
40	60.2	4.1	59.0	4.3
42	64.4	4.2	63.2	4.2
44	68.6	4.2	67.5	4.3
46	73.0	4.4	71.9	4.4
48	77.4	4.4*	76.3	4.4
50	81.8	4.4	80.7	4.4*
52	86.3	4.5	85.3	4.6
54	.....	.....	89.8	4.5
		3)13.3		13.5
		2)4.433		4.5
		2.2166		2.25
		2.2500		
		2)4.4666		
		2.2333	Velocity with a Motive Weight of 4 lbs. 3 oz.	

SATURDAY, August 29, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its foremost extremity, called d.

System Two-fold.

Motive Weight 8 lbs. 6 oz.						
Accelerating Wt. none.			Accel. Wt. 2 lbs.		Accel. Wt. 2 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.2	2.2	1.8	1.8	1.4	1.4
4	3.7	1.5	4.0	2.2	3.8	2.4
6	5.8	2.1	6.7	2.7	6.4	2.6
8	8.3	2.5	9.9	3.2	9.4	3.0
10	11.0	2.7	13.5	3.6	12.8	3.4
12	14.2	3.2	17.3	3.8	16.6	3.8
14	17.7	3.5	21.5	4.2	20.8	4.2
16	21.6	3.9	26.0	4.5	25.1	4.3
18	25.7	4.1	30.7	4.7	29.8	4.7
20	30.1	4.4	35.7	5.0	34.6	4.8
22	34.7	4.6	41.0	5.3	39.7	5.1
24	39.6	4.9	46.5	5.5	45.2	5.5
26	44.8	5.2	52.0	5.5	50.6	5.4
28	50.2	5.4	57.8	5.8	56.3	5.7
30	55.7	5.5	63.8	6.0	62.2	5.9
32	61.5	5.8	69.8	6.0*	68.1	5.9
34	67.3	5.8	76.1	6.3	74.2	6.1*
36	73.4	6.1*	82.3	6.2	80.3	6.1
38	79.5	6.1	.....	.....	86.4	6.1
40	85.7	6.2	.....	.....	.....	.....
		3)18.4		18.5		18.3
		2)6.1333		6.1667		6.1
		3.0666		3.0833		3.05
		3.0833				
		3.0500				
		3)9.1999				
		3.0666	Velocity with a Motive Weight of 8 lbs. 6 oz.			

SATURDAY, August 29, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its foremost extremity, called d.

System Two-fold.

Total Weight 34 lbs. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 28 lbs.			A. Wt. 28 lbs.		A. Wt. 32 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.7	4.7	3.7	3.7	3.8	3.8
4	10.9	6.2	8.8	5.1	9.1	5.3
6	28.1	7.2	15.0	6.2	15.7	6.6
8	25.4	7.3	22.7	7.7	23.7	8.0
10	34.3	8.9	30.6	7.9	31.5	7.8
12	42.9	8.6	39.1	8.5	40.2	8.7
14	51.8	8.9	48.0	8.9	48.9	8.7
16	60.7	8.9	56.9	8.9	57.7	8.8
18	69.6	8.9*	65.7	8.8	66.7	9.0
20	78.8	9.2	74.8	9.1	75.8	9.1*
22	.....	.....	84.0	9.2	85.0	9.2
		2)18.1		18.3		18.3
		2)9.05		9.15		9.15
		4.525		4.575		4.575
		4.575				
		4.575				
		3)13.675				
		4.5583 Velocity with a Motive Weight of 16 lbs. 12 oz.				

FRIDAY, August 28, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its foremost extremity, called d.

Thermometer in the Air, 62°;—In the Dock, 68°.
—Moderate Breeze, N.W.

System Two-fold.

Total Wt. 67 lbs. 10 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 35 lbs.			Accel. Wt. 35 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.4	3.4	4.4	4.4
4	10.6	7.2	11.3	6.9
6	19.7	9.1	20.3	9.0
8	30.6	10.9	31.0	10.7
10	42.2	11.6	42.6	11.6
12	54.1	11.9	54.5	11.9
14	66.3	12.2*	66.6	12.1*
16	78.5	12.2	78.7	12.1
		2)24.4		24.2
		2)12.2		12.1
		6.10		6.05
		6.05		
		2)12.15		
		6.075 Velocity with a M. W. of 33 lbs. 8 oz.		

System Ten-fold.

Total Wt. 786 lbs.			Motive Wt. 67 lbs.	
Accel. Wt. 134 lbs.			Accel. Wt. 134 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	10.1	10.1	8.3	8.3
4	21.5	11.4	19.5	11.2
6	35.3	13.8	33.1	13.6
8	49.6	14.3	47.4	14.3
10	64.6	15.0	63.1	15.7
12	79.8	15.2	78.7	15.6
14	95.5	15.7	94.4	15.7
16	111.4	15.9	110.3	15.9
18	127.2	15.8	126.5	16.2
20	143.4	16.2*	142.7	16.2*
		2)16.2		16.2
		8.1		8.1
		8.1		
		2)16.2		
		8.1 Velocity with a Motive Weight of 67 lbs.		

FRIDAY, August 28, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its foremost extremity, called d.

System Ten-fold.

Total Wt. 1052 lbs. M. Wt. 100 lbs. 8 oz.				
Accelerating Wt. 134 lbs.			Accel. Wt. 134 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	11.5	11.5	9.5	9.5
4	26.4	14.9	23.2	13.7
6	43.5	17.1	39.7	16.5
8	62.2	18.7	57.7	18.0
10	81.8	19.6	76.9	19.2
12	101.5	19.7	96.6	19.7
14	121.7	20.2*	116.7	20.1
16	141.7	20.0	136.7	20.0*
18	.....	.....	156.8	20.1
		2)40.2		40.1
		2)20.1		20.05
		10.050		10.025
		10.025		
		2)20.075		
Velocity with a Motive Weight of 100 lbs. 8 oz. . .		10.0375		

TUESDAY, August 25, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to its foremost extremity, called d.

Thermometer in the Air, 71°;—In the Dock, 70°.—Wind East, almost Calm.

System Ten-fold.

Motive Weight 134 lbs.						
Accelerating Wt. none.			Accel. Wt. 267 lbs.		Accel. Wt. 267 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	9.6	9.6	16.2	16.2	14.1	14.1
4	23.8	14.2	36.1	19.9	32.1	18.0
6	40.6	16.8	57.4	21.3	52.0	19.9
8	59.6	19.0	79.6	22.2	73.4	21.4
10	79.4	19.8	102.8	23.2	95.7	22.3
12	100.0	20.6	126.4	23.6	118.9	23.2
14	129.9	20.9	150.1	23.7*	142.3	23.4
16	142.2	22.3	.....	.....	165.9	23.6*
18	163.6	21.4				
20	185.3	21.7		2)23.7		23.6
22	207.4	22.1				
24	229.8	22.4		11.85		11.8
26	252.5	22.7		11.90		
28	275.6	23.1		11.80		
30	299.2	23.6				
32	323.0	23.8*		3)35.55		
		2)23.8		11.85	Velocity with a Motive Weight of 134 lbs.	
		11.9				

Parallelopipedon b, lengthened by adding a semi-ellipsis to each extremity, called e.

Semi-ellipsis fore and after bodies.

	Motive Weights.									
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment	.....	1.8225	2.4791	3.3500	4.850	6.3625	8.2250	10.058	.....
Hutt. Correction, or Regular Series	.....	1.8255	2.4729	3.3500	4.5382	6.1477	8.3300	9.9464	11.282

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.5297	2.5791	6.5096	12.555	20.899	31.690	45.037	61.092	79.986	101.74	126.48	154.27	202.81
Total of diminution plus and minus pressure by bodies c and b.	0.5569	2.4643	5.879	10.894	17.578	23.980	36.144	48.13	61.92	77.61	95.24	114.65	148.17
Diminution by bodies b and c b e.....	0.7554	3.0575	6.875	12.168	18.896	27.020	36.529	47.36	59.42	72.81	87.45	102.24	129.66

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz. drs.		lbs. oz.																					
2 1 8	and	4	3	2.2527																			
		8	6	2.2773	4	3..	8	6	2.3023														
		16	12	2.1246			16	12	2.0657	8	6..	16	12	1.8733									
		33	8	2.2176			33	8	2.2063			33	8	2.1612	16	12..	33	8	2.5535					
		67	0	2.2999			67	0	2.3116			67	0	2.3151			67	0	2.6246	33	8..	67	0	2.6996
		100	8	2.2663			100	8	2.2693			100	8	2.2603			100	8	2.4565			100	8	2.3990

67.. 100 8 2.0154

21) 47.9523

Mean 2 lbs. 1 oz. 8 drs. and 8 lbs. 6 oz... 2.2834

TUESDAY, September 8, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to each extremity, called e.

Thermometer in the Air, 69°;—In the Dock, 70½°.—Moderate, S.W.

System Two-fold.

Motive Weight 2 lbs. 1 oz. 8 drs.				
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.4	1.4	1.3	1.3
4	3.0	1.6	2.9	1.6
6	4.8	1.8	4.6	1.7
8	6.8	2.0	6.6	2.0
10	9.0	2.2	8.6	2.0
12	11.3	2.3	10.9	2.3
14	13.7	2.4	13.3	2.4
16	16.4	2.7	15.9	2.6
18	19.2	2.8	18.6	2.7
20	22.1	2.9	21.5	2.9
22	25.2	3.1	24.5	3.0
24	28.4	3.2	27.7	3.2
26	31.6	3.2	31.0	3.3
28	35.1	3.5	34.3	3.3
30	38.0	2.9	37.8	3.5
32	41.6	3.6	41.2	3.4
34	45.2	3.6	44.7	3.5
36	48.7	3.5	48.3	3.6
38	52.3	3.6	51.8	3.5
40	55.9	3.6	55.5	3.7
42	59.5	3.6	59.1	3.6
44	63.0	3.5	62.7	3.6
46	66.6	3.6	66.4	3.6†
48	70.2	3.6*	70.0	3.6*
50	73.8	3.6	73.7	3.7
52	77.4	3.6	77.3	3.6
54	81.0	3.6	81.0	3.7
56	84.7	3.7	84.6	3.6
58	88.4	3.7	88.3	3.7
60	.....	.....	92.0	3.7
		6)21.8		7)25.6
		2)3.633		3.657
		1.8166		1.8285
		1.8285		
		2)3.6451		
		1.8225	Velocity with a Motive Weight of 2 lbs. 1 oz. 8 drs.	

† Query 3.7?

TUESDAY, September 8, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to each extremity, called e.

System Two-fold.

Motive Weight 4 lbs. 3 oz.				
Accelerating Wt. 6 lbs.			Accel. Wt. 6 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.7	1.7	2.3	2.3
4	3.7	2.0	5.0	2.7
6	6.2	2.5	8.0	3.0
8	8.6	2.4	11.2	3.2
10	11.8	3.2	14.8	3.6
12	15.1	3.3	18.6	3.8
14	18.7	3.6	22.6	4.0
16	22.5	3.8	27.0	4.4
18	26.6	4.1	31.4	4.4
20	30.8	4.2	35.7	4.3
22	35.2	4.4	40.4	4.7
24	39.6	4.4	45.1	4.7
26	44.2	4.6	50.0	4.9
28	48.8	4.6	54.7	4.7
30	53.6	4.8	59.6	4.9
32	58.4	4.8	64.4	4.8
34	63.2	4.8*	69.3	4.9*
36	68.2	5.0	74.2	4.9
38	73.1	4.9	79.1	4.9
40	78.2	5.1	84.2	5.1
42	83.2	5.0	.....	.....
44	88.2	5.0	.....	.....
		6)29.8		4)19.8
		2)4.9667		4.95
		2.4833		2.475
		2.4750		
		2)4.9583		
		2.4791 Velocity with a Motive Weight of 4 lbs. 3 oz.		

System Two-fold.

Motive Weight 8 lbs. 6 oz.				
Accelerating Wt. 6 lbs.			Accel. Wt. 6 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.9	2.9	1.9	1.9
4	6.2	3.3	4.4	2.5
6	10.1	3.9	7.5	3.1
8	14.2	4.1	14.9	.....
10	18.8	4.6	19.4	4.5
12	23.8	5.0	24.2	4.8
14	29.2	5.4	29.6	5.3
16	34.5	5.3	35.1	5.5
18	40.5	6.0	40.8	5.7
20	46.5	6.0	46.8	6.0
22	52.7	6.2	53.0	6.2
24	59.0	6.3	59.3	6.3
26	65.4	6.4	65.8	6.5
28	72.0	6.6	72.3	6.5
30	78.7	6.7*	79.0	6.7*
32	85.4	6.7	85.7	6.7
		2)13.4		13.4
		2)6.7		6.7
		3.35		3.35
		3.35		
		2)6.70		
		3.35 Velocity with a Motive Weight of 8 lbs. 6 oz.		

TUESDAY, September 8, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to each extremity, called e.

System Three-fold.

Total Wt. 51 lbs. 15 oz.			M. W. 16 lbs. 12 oz.	
Accelerating Wt. 18 lbs.			Accel. Wt. 18 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.9	2.9	2.9	2.9
4	6.9	4.0	6.8	3.9
6	11.8	4.9	11.8	5.0
8	17.6	5.8	17.7	5.9
10	24.2	6.6	24.3	6.6
12	31.4	7.2	31.6	7.3
14	39.2	7.8	39.4	7.8
16	47.4	8.2	47.6	8.2
18	55.8	8.4	56.2	8.6
20	64.5	8.7	65.0	8.8
22	73.4	8.9	74.0	9.0
24	82.5	9.1	83.2	9.2
26	91.6	9.1	92.6	9.4
28	101.0	9.4	102.2	9.6
30	110.4	9.4	111.8	9.6
32	120.1	9.7*	121.5	9.7*
34	129.8	9.7	131.2	9.7
		2)19.4		19.4
		2)9.7		9.7
		4.85		4.85
		4.85		
		2)9.70		
		4.85 Velocity with a Motive Wt. of 16 lbs. 12 oz. †		

† For experiments made with the Motive Weight of 33 lbs. 8 oz.; see p. 104.

SATURDAY, September 5, 1795.

Thermometer in the Air 70°;—In the Dock, 68°.
—Strong Breeze, S.W.

System Three-fold.

Total Wt. 207 lbs. 15 oz.			Motive Wt. 67 lbs.	
Accel. Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.2	5.2	6.8	6.8
4	14.2	9.0	17.2	10.4
6	26.5	12.3	30.2	13.0
8	40.7	14.2	45.1	14.9
10	56.5	15.8	61.2	16.1
12	72.4	15.9	77.4	16.2
14	88.8	16.4	93.9	16.5
16	105.2	16.4*	110.4	16.5*
18	121.7	16.5	126.9	16.5
20	138.0	16.3	.....	.....
		3)49.2		2)33.0
		2)16.4		16.5
		8.20		8.25
		8.25		
		2)16.450		
		8.225 Velocity with a Motive Weight of 67 lbs.		

SATURDAY, September 5, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to each extremity, called e.

System Three-fold.

Total Wt. 105 lbs. 15 oz. M. Wt. 33 lbs. 8 oz.				
Accelerating Wt. 37 lbs.			Accel. Wt. 37 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.9	3.9	3.5	3.5
4	10.0	6.1	9.3	5.8
6	18.2	8.2	17.2	7.9
8	28.1	9.9	27.2	10.0
10	38.9	10.8	37.9	10.7
12	50.3	11.4	49.8	11.9
14	62.0	11.7	62.1	12.3
16	74.3	12.3	74.4	12.3
18	86.7	12.4	86.9	12.5
20	99.2	12.5	99.5	12.6
22	111.8	12.6*	112.3	12.8*
24	124.6	12.8	125.0	12.7
		2)25.4		25.5
		2)12.7		12.75
		6.350		6.375
		6.375		
		2)12.725		
		6.3625 Velocity with a Motive Weight of 33 lbs. 8 oz.		

WEDNESDAY, September 2, 1795.

Parallelopipedon b, lengthened by adding a semi-ellipsis to each extremity, called e.

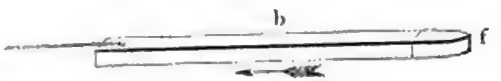
Thermometer in the Air, 71°;—In the Dock 69½°.—Fresh Breeze, Easterly.

	System Ten-fold.				System Three-fold.	
Total Wt. 1092 lbs.	M. Wt. 100 lbs. 8 oz.				T. Wt. 307 lbs. 3 oz.	
Accel. Wt. 133½ lbs.		A. Wt. 133½ lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	9.4	9.4	7.2	7.2	6.9	6.9
4	22.6	13.2	19.0	11.8	18.8	11.9
6	38.7	16.1	33.8	14.8	34.4	15.6
8	56.6	17.9	51.0	17.2	52.9	18.5
10	75.7	18.9	68.9	17.9	72.2	19.3
12	95.4	19.7	88.1	19.2	92.4	20.2
14	115.6	20.2*	107.6	19.5	112.5	20.1*
16	135.7	20.1	127.6	20.0*	132.6	20.1
18	.....	.....	147.8	20.2	.....	.....
		2)40.3		40.2		40.2
		2)20.15		20.1		20.1
		10.075		10.05		10.05†
		10.050				
		10.050				
		3)30.175				
		10.058 Velocity with a Motive Weight of 100 lbs. 8 oz.				

† The third experiment was made on Saturday, September 5, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its hindmost extremity, called f.

Half length of the chord 3.605 feet. Versed sine 0.6095 feet.



	Motive Weights.												
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment	.....	.....	1.7750	2.5041	3.5666	4.8833	6.6500	7.9125	9.0125
Hutt. Correction, or Regular Series	.....	3.3181	1.8161	2.5019	3.4467	4.7484	6.5419	7.8903	9.0125

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.1517	5.1596	12.405	23.116	37.458	55.569	77.568	103.55	133.60	167.80	206.22	248.95	322.59
Parallelopipedon b	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Diminution of the minus pressure by body f. .	0.1334	0.4770	0.980	1.607	2.337	3.141	3.998	4.90	5.81	6.75	7.71	8.56	9.88

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.		lbs. oz.																			
4 3	and	8 6	2.0142																		
		16 12	1.9866	8 6..	16 12	1.9598															
		33 8	2.0548		33 8	2.0756	16 12..	33 8	2.2060												
		67 0	2.0991		67 0	2.1291		67 0	2.2252	33 8..	67 0	2.2446								
		100 8	2.1263		100 8	2.1599		100 8	2.2486		100 8	2.2763	67..	100 8	2.3326					
		134 0	2.1329		134 0	2.1649		134 0	2.2432		134 0	2.2623		134 0	2.2802	100 8..	134	2.2101		

21)45.4323

Mean 8 lbs. 6 oz. and 134 lbs... 2.1634

SATURDAY, September 19, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its hindmost extremity, called f.

Thermometer in the Air, 77°;—In the Dock, 69°.—Wind Easterly.

System Three-fold.

r. w. 13lbs. m. w. 4lbs. 3oz.		
Accelerating Wt. none.		
Sec.	Feet.	Differences.
4	2.5	2.5
8	5.6	3.1
12	9.4	3.8
16	13.8	4.4
20	18.5	4.7
24	23.7	5.2
28	29.1	5.4
32	34.8	5.7
36	40.6	5.8
40	46.7	6.1
44	52.9	6.2
48	59.3	6.4
52	65.8	6.5
56	72.4	6.6
60	79.0	6.6
64	85.7	6.7
68	92.4	6.7
72	99.2	6.8
76	105.9	6.7
80	112.9	7.0
84	119.9	7.0
88	127.0	7.1*
92	134.1	7.1
96	141.2	7.1

3)21.3

4)7.100

1.775 Velocity with a Motive Wt. of 4 lbs. 3 oz.

TUESDAY, September 15, 1795.

Thermometer in the Air, 64°;—In the Dock, 68½°.—Light Breeze, Easterly.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.3	4.3	4.2	4.2
8	9.9	5.6	9.7	5.5
12	16.6	6.7	16.4	6.7
16	24.3	7.7	23.9	7.5
20	32.5	8.2	49.7	.....
24	41.0	8.5	59.0	9.3
28	50.0	9.0	68.4	9.4
32	59.2	9.2	78.0	9.6
36	68.6	9.4	87.6	9.6
40	78.1	9.5	97.3	9.7
44	87.8	9.7	107.1	9.8
48	97.6	9.8	115.3	8.2
52	107.4	9.8	125.2	9.9
56	117.4	10.0*	135.2	10.0*
60	127.4	10.0	145.2	10.0
64	137.5	10.1	.....	.....

3)30.1 — 20.0

4)10.0333 — 10.0

2.5083 — 2.5
2.5000

2)5.0083

2.5041 Velocity with a Motive Wt. of 8 lbs. 6 oz.

TUESDAY, September 15, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its hindmost extremity, called f.

System Three-fold.

Total Wt. 51 lbs. Motive Wt. 16 lbs. 12 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.8	1.8	3.0	3.0
4	4.5	2.7	6.8	3.8
6	8.0	3.5	11.2	4.4
8	12.1	4.1	16.0	4.8
10	16.8	4.7	21.3	5.3
12	22.0	5.2	26.9	5.6
14	27.5	5.5	32.8	5.9
16	33.4	5.9	38.8	6.0
18	39.4	6.0	45.1	6.3
20	45.6	6.2	51.4	6.3
22	52.0	6.4	57.8	6.4
24	58.2	6.2	64.4	6.6
26	65.2	7.0	71.0	6.6
28	71.9	6.7	77.7	6.7
30	78.7	6.8	84.5	6.8
32	85.7	7.0	91.4	6.9
34	92.6	6.9	98.2	6.8
36	99.5	6.9	105.2	7.0
38	106.6	7.1	112.2	7.0
40	113.7	7.1	119.4	7.2
42	120.9	7.2	126.4	7.0
44	128.0	7.1	133.5	7.1*
46	135.1	7.1*	140.6	7.1
48	142.3	7.2	147.7	7.1
50	149.5	7.2	.....	.....
		3)21.5		21.3
		2)7.1666		7.10
		3.5833		3.55
		3.5500		
		2)7.1333		
		3.5666 Velocity with a Motive Weight of 16 lbs. 12 oz.		

TUESDAY, September 15, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its hindmost extremity, called f.

System Three-fold.

Total Weight 102 lbs. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.0	4.0	2.9	2.9	4.5	4.5
4	9.4	5.4	7.2	4.3	10.5	6.0
6	16.0	6.6	13.2	6.0	17.5	7.0
8	23.5	7.5	20.2	7.0	25.3	7.8
10	31.7	8.2	28.0	7.8	33.8	8.5
12	40.5	8.8	36.5	8.5	42.7	8.9
14	49.5	9.0	45.4	8.9	51.7	9.0
16	58.7	9.2	54.5	9.1	61.0	9.3
18	68.0	9.3	63.9	9.4	70.4	9.4
20	77.5	9.5	73.4	9.5	80.1	9.7
22	87.0	9.5	82.9	9.5	89.6	9.5
24	96.7	9.7	92.6	9.7	99.4	9.8
26	106.5	9.8*	102.5	9.9	109.2	9.8*
28	116.2	9.7	112.3	9.8*	118.9	9.7
30	126.0	9.8	122.0	9.7	128.8	9.9
32	135.7	9.7	131.7	9.7	138.6	9.8
34	.....	.....	141.5	9.8	.....	.....
		4)39.0		39.0		39.2
		2)9.750		9.750		9.8
		4.875		4.875		4.9
		4.875				
		4.900				
		3)14.650				
		4.8833 Velocity with a Motive Weight of 33 lbs. 8 oz.				

FRIDAY, September 18, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its hindmost extremity, called f.

Thermometer in the Air, 70°;—In the Dock, 68½°.
—Calm.

System Three-fold.

r. w. 206 lbs. m.w. 67 lbs.		
Accelerating Wt. none.		
Sec.	Feet.	Differences.
2	5.3	5.3
4	13.5	8.2
6	23.6	10.1
8	35.0	11.4
10	46.9	11.9
12	59.3	12.4
14	72.0	12.7
16	85.0	13.0
18	98.1	13.1
20	111.4	13.3
22	124.7	13.3
24	138.0	13.3*

2)13.3

6.65 Velocity with a M. Wt. of 67 lbs.

System Three-fold.

Total Wt. 308 lbs. Motive Wt. 100 lbs. 8 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	11.0	11.0	8.4	8.4
4	24.4	13.4	20.3	11.9
6	39.0	14.6	34.3	14.0
8	54.2	15.2	49.2	14.9
10	69.6	15.4	64.4	15.2
12	85.4	15.8	80.0	15.6
14	101.3	15.9*	95.7	15.7
16	117.2	15.9	111.4	15.7*
18	.....	.....	127.2	15.8
		2)31.8		31.5
		2)15.9		15.75
		7.950		7.875
		7.875		
		2)15.825		

7.9125 Velocity with a M. Wt. of 100 lbs. 8 oz.

FRIDAY, September 18, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its hindmost extremity, called f.

System Three-fold.

Total Wt. 410 lbs.			Motive Wt. 134 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.3	8.3	6.2	6.2
4	21.6	13.3	16.7	10.5
6	37.8	16.2	31.4	14.7
8	54.9	17.1	48.1	16.7
10	72.6	17.7	65.5	17.4
12	90.6	18.0	83.5	18.0
14	108.6	18.0*	101.7	18.2
16	126.5	17.9	119.7	18.0
	2)35.9			36.2
	2)17.95			18.1
	8.975			9.05
	9.050			
	2)18.025			
	9.0125 Velocity with a Motive Weight of 134 lbs.			

Parallelopipedon b, lengthened by having a circular wedge added to its foremost extremity, called g.

	Motive Weights.									
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	
Velocity per Experiment	.....	.....	2.4208	3.6830	4.9500	6.3250	8.5666	10.925	.....	
Hutt. Correction, or Regular Series	.....	1.7976	2.4567	3.3571	4.5874	6.2688	8.5666	10.284	11.706	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.5695	2.6527	6.5249	12.357	20.278	30.394	42.794	57.558	74.758	94.454	116.70	141.57	184.69
Parallelopipedon b	1.2851	5.6366	13.3850	24.723	39.795	58.710	81.566	108.450	139.410	174.550	213.93	257.51	332.47
Diminution of the plus pressure by body g..	0.7156	2.9839	6.8601	12.366	19.517	28.316	38.772	50.892	64.652	80.096	97.23	115.94	147.78

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.																
4 3 and	8 6	1.6518															
	16 12	1.9380	8 6..	16 12	2.3445												
	33 8	2.1652		33 8	2.5635	16 12..	33 8	2.8279									
	67 0	2.1939		67 0	2.4633		67 0	2.5275	33 8..	67 0	2.2848						
	100 8	2.1089		100 8	2.2854		100 8	2.2623		100 8	2.0101	67..	100 8	1.6673			

15)33.2954

Mean 4 lbs. 3 oz. and 67 lbs.. 2.2197

SATURDAY, September 19, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its foremost extremity, called g.

Thermometer in the Air, 77°;—In the Dock, 69°.—Easterly.

System Three-fold.

Total Weight 13 lbs. Motive Weight 4 lbs. 3 oz.						
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.		Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.4	2.4	2.9	2.9	3.1	3.1
8	5.7	3.3	6.5	3.6	7.1	4.0
12	10.1	4.4	11.1	4.6	12.1	5.0
16	15.3	5.2	16.6	5.5	18.0	5.9
20	21.4	6.1	22.8	6.2	24.5	6.5
24	28.3	6.9	29.8	7.0	31.8	7.3
28	35.7	7.4	37.3	7.5	39.6	7.8
32	43.9	8.2	45.5	8.2	47.8	8.2
36	52.5	8.6	54.2	8.7	56.4	8.6
40	61.6	9.1	63.0	8.8	65.1	8.7
44	70.7	9.1	72.2	9.2	73.8	8.7
48	80.0	9.3	81.4	9.2	82.8	9.0
52	89.3	9.3	90.7	9.3	91.9	9.1
56	98.7	9.4	100.0	9.3	101.1	9.2
60	108.0	9.3	109.4	9.4	110.3	9.2
64	117.4	9.4	118.9	9.5	119.7	9.4
68	127.0	9.6	128.5	9.6	129.2	9.5
72	136.7	9.7*	138.2	9.7*	138.9	9.7*
76	146.4	9.7	147.8	9.6	148.6	9.7
		2)19.4		19.3		19.4
		4)9.7		9.65		9.7
		2.4250		2.4125		2.425
		2.4125				
		2.4250				
		3)7.2625				
		2.4208 Velocity with a Motive Weight of 4 lbs. 3 oz.				

TUESDAY, September 15, 1795.

Parallelopipedon **b**, lengthened by having a circular wedge added to its foremost extremity, called **g**.

Thermometer in the Air, 64°;—In the Dock, 63½°.
—Light Breeze, Easterly.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 15 lbs.			Accel. Wt. 15 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.9	4.9	4.7	4.7
8	12.4	7.5	12.1	7.4
12	22.0	9.6	21.5	9.4
16	33.2	11.2	32.6	11.1
20	45.4	12.2	45.0	12.4
24	58.6	13.2	58.2	13.2
28	72.2	13.6	72.2	14.0
32	86.3	14.1	86.6	14.4
36	100.2	13.9	101.1	14.5
38	107.4	7.2	108.4	7.3
40	114.7	7.3	115.7	7.3
42	122.0	7.3	122.5	6.8
44	129.4	7.4*	129.8	7.3*
46	136.8	7.4	137.2	7.4
48	144.1	7.3	144.6	7.4
		3)22.1		22.1
		2)7.366		7.366
		3.683		3.683
		3.683		
		2)7.366		
		3.683 Velocity with a M. W. of 8 lbs. 6 oz.		

System Three-fold.

Total Wt. 51 lbs. Motive Wt. 16 lbs. 12 oz.				
Accel. Weight 18 lbs.			Accel. Wt. 18 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.0	4.0	2.8	2.8
4	9.1	5.1	6.7	3.9
6	15.1	6.0	11.7	5.0
8	22.0	6.9	17.8	6.1
10	29.6	7.6	24.7	6.9
12	38.0	8.4	32.5	7.8
14	46.7	8.7	40.8	8.3
16	56.0	9.3	49.6	8.8
18	65.7	9.7	59.0	9.4
20	74.8	9.1	68.5	9.5
22	84.4	9.6	78.3	9.8
24	94.1	9.7	88.1	9.8
26	103.8	9.7	97.8	9.7
28	113.7	9.9	107.7	9.9
30	123.5	9.8	117.6	9.9
32	133.4	9.9*	127.5	9.9*
34	143.3	9.9	137.4	9.9
36	.....	.....	147.3	9.9
		2)19.8		3)29.7
		2)9.90		9.90
		4.95		4.95
		4.95		
		2)9.90		
		4.95 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

TUESDAY, September 15, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its foremost extremity, called g.

System Three-fold.

Total Wt. 102 lbs.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.0	5.0	4.6	4.6
4	12.1	7.1	11.3	6.7
6	21.1	9.0	19.9	8.6
8	31.6	10.5	30.1	10.2
10	43.2	11.6	41.4	11.3
12	55.5	12.3	53.4	12.0
14	68.1	12.6	65.8	12.4
16	80.7	12.6	78.4	12.6
18	.....	.....	91.0	12.6
20	106.1	.....	103.7	12.7
22	118.7	12.6*	116.3	12.6*
24	131.4	12.7	129.0	12.7
		2)25.3		25.3
		2)12.65		12.65
		6.325		6.325
		6.325		
		2)12.650		
		6.325	Velocity with a Motive Weight of 33 lbs. 8 oz.	

FRIDAY, September 18, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its foremost extremity, called g.

Thermometer in the Air, 70°;—In the Dock, 68½°.—Calm.

System Three-fold.

Total Weight 206 lbs. Motive Weight 67 lbs.						
Accelerating Wt. 42 lbs.			A. Wt. 42 lbs.		A. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.3	5.3	6.7	6.7	6.8	6.8
4	14.5	9.2	17.2	10.5	17.4	10.6
6	26.7	12.2	30.4	13.2	33.4	16.0
8	41.3	14.6	45.6	15.2	48.7	15.3
10	57.0	15.7	61.9	16.3	63.2	14.5
12	73.4	16.4	78.6	16.7	80.5	17.3
14	89.8	16.4	95.6	17.0	97.8	17.3
16	106.4	16.6	112.6	17.0*	115.1	17.3*
18	123.4	17.0*	129.8	17.2	132.3	17.2
20	140.5	17.1	.....	.....	.....	.....
		2)34.1		34.2		34.5
		2)17.05		17.1		17.25
		8.525		8.55		8.625†
		8.550				
		8.625				
		3)25.700				
		8.5666 Velocity with a Motive Weight of 67 lbs.				

† The third experiment was made on Tuesday, September 15, 1795.

FRIDAY, September 18, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to its foremost extremity, called g.

System Three-fold.

Total Wt. 308 lbs.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	13.2	13.2	10.7	10.7
4	30.4	17.2	26.2	15.5
6	50.3	19.9	45.3	19.1
8	71.6	21.3	66.3	21.0
10	93.5	21.9*	81.1	21.8
12	115.3	21.8	109.9	21.8*
14	.....	.....	131.8	21.9
		2)43.7		43.7
		2)21.85		21.85
		10.925		10.925
		10.925		
		2)21.850		
		10.925	Velocity with a Motive Weight of 100 lbs. 8 oz.	

Parallelopipedon b, lengthened by having a circular wedge added to each extremity, called h.
Half length of the chord 3.605 feet.

	Motive Weights.										
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	
Velocity per Experiment.....	.....	.....	2.7902	4.0000	5.2541	6.6750	9.0000	11.6000	.....	
Hutt. Correction, or Regular Series.....		2.0276	2.7319	3.6805	4.9584	6.6803	9.0000	10.714	12.125	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.4045	2.0277	5.2064	10.164	17.078	26.096	37.348	50.947	67.000	85.608	106.85	130.81	172.83
Diminution by bodies b and hbh	0.8806	3.6089	8.179	14.559	22.717	32.614	44.218	57.50	72.41	88.94	107.08	126.70	159.64
Diminution of the plus and minus pressure by bodies f and g.....	0.8490	3.4609	7.840	13.973	21.854	31.457	42.770	55.792	70.462	86.846	104.94	124.50	157.66

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.																
4 3 and	8 6	1.9245															
	16 12	2.1903	8 6..	16 12	2.5416												
	33 8	2.3840		33 8	2.7071	16 12..	33 8	2.8959									
	67 0	2.3675		67 0	2.5643		67 0	2.5758	33 8..	67 0	2.3193						
	100 8	2.2303		100 8	2.3339		100 8	2.2623		100 8	1.9881	67..	100 8	1.5978			

15)34.8827

Mean 33 lbs. 8 oz. and 67 lbs... 2.3255

SATURDAY, September 12, 1795.

Parallelopipedon **b**, lengthened by having a circular wedge added to each extremity, called **h**.

Thermometer in the Air, 66½°;—In the Dock, 69½°.—Light Airs, Easterly.

System Three-fold.

Total Weight 12 lbs. 14 oz. Motive Weight 4 lbs. 3 oz.						
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.		Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.3	3.3	3.2	3.2	3.4	3.4
8	7.1	4.1	7.5	4.3	7.9	3.5
12	12.3	5.2	12.8	5.3	13.4	5.5
16	18.4	6.1	19.0	6.2	19.8	6.4
20	25.4	7.0	26.0	7.0	27.1	7.3
24	33.2	7.8	33.8	7.8	35.2	8.1
28	41.8	8.6	42.4	8.6	44.1	8.9
32	51.6	9.8	51.6	9.2	53.5	9.4
36	61.0	9.4	61.4	9.8	63.7	10.2
40	71.3	10.3	71.4	10.0	74.1	10.4
44	81.9	10.6	81.7	10.3	84.8	10.7
48	92.7	10.8	92.2	10.5	95.8	11.0
52	103.8	11.1	103.0	10.8	106.8	11.0
56	115.0	11.2*	113.9	10.9*	118.0	11.2*
60	126.2	11.2	125.0	11.1	129.3	11.3
64	.....	.....	136.1	11.1	.....	.....
		2)22.4		3)33.1		2)22.5
		4)11.2		11.0333		11.25
		2.8000		2.7583		2.8125
		2.7583				
		2.8125				
		3)8.3708				
		2.7902 Velocity with a Motive Weight of 4 lbs. 3 oz.				

SATURDAY, September 12, 1795. FRIDAY, September 11, 1795.

Parallelopipedon b, lengthened by adding a circular wedge to each extremity, called h.

Thermometer in the Air, 71°;—In the Dock, 70°.—Calm.

System Three-fold.

T. W. 25 lbs. 9 oz.	M. W. 8 lbs. 6 oz.	
Accelerating Wt. 8 lbs.		
Sec.	Feet.	Differences.
2	2.4	2.4
4	5.2	2.8
6	8.6	3.4
8	12.5	3.9
10	16.9	4.4
12	21.7	4.8
14	27.0	5.3
16	32.7	5.7
18	38.8	6.1
20	45.2	6.4
22	52.0	6.8
24	59.0	7.0
26	66.2	7.0
28	73.8	7.6
30	81.3	7.5
32	89.0	7.7
34	96.9	7.9
36	104.8	7.9
38	112.8	8.0*
40	120.8	8.0
42	128.8	8.0
		3)24.0
		2)8.0
Velocity with a M. Wt. of 8 lbs. 6 oz.		4.0

System Three-fold.

Total Wt. 51 lbs.		M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. 14 lbs.		Accel. Wt. 20 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.9	2.9	3.4	3.4
4	6.7	3.8	7.8	4.4
6	11.7	5.0	13.3	5.5
8	17.5	5.8	19.8	6.5
10	24.0	6.5	27.2	7.4
12	31.5	7.5	35.4	8.2
14	39.7	8.2	44.4	9.0
16	48.6	8.9	53.6	9.2
18	57.6	9.0	63.4	9.8
20	67.2	9.6	73.3	9.9
22	77.0	9.8	83.4	10.1
24	87.0	10.0	93.7	10.3
26	97.1	10.1	104.2	10.5
28	107.5	10.4	114.7	10.5
30	117.8	10.3*	125.3	10.6*
32	128.3	10.5	135.8	10.5
34	138.9	10.6	.....	.....
		3)31.4		2)21.1
		2)10.4666		10.550
		5.2333		5.275
		5.2750		
		2)10.5083		
		5.2541	Velocity with a Motive Wt. of 16 lbs. 12 oz.	

FRIDAY, September 11, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to each extremity, called h.

System Three-fold.

Total Wt. 102 lbs. Motive Wt. 33 lbs. 8 oz.				
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.5	5.5	5.1	5.1
4	13.3	7.8	12.5	7.4
6	22.7	9.4	21.5	9.0
8	33.6	10.9	32.3	10.8
10	45.7	12.1	44.0	11.7
12	58.4	12.7	56.7	12.7
14	71.3	12.9	69.4	12.7
16	84.5	13.2	82.6	13.2
18	97.8	13.3	95.8	13.2
20	111.1	13.3*	109.2	13.4*
22	.....	.....	122.6	13.4
		2)13.3		2)26.8
		6.65		13.4
		6.70		6.7
		2)13.35		
		6.675	Velocity with a Motive Wt. of 33 lbs. 8 oz.	

SATURDAY, September 12, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to each extremity, called h.

Thermometer in the Dock, 69½°.—Light Airs, Easterly.

System Three-fold.

Total Weight 206 lbs. Motive Weight 67 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.7	6.7	7.2	7.2	9.1	9.1
4	17.6	10.9	18.1	10.9	21.6	12.5
6	31.5	13.9	31.9	13.8	36.8	15.2
8	47.6	16.1	48.0	16.1	53.8	17.0
10	65.0	17.4	65.4	17.4	71.3	17.5
12	82.4	17.4	83.3	17.9	89.2	17.9
14	100.3	17.9	101.4	18.1	107.0	17.8*
16	118.3	18.0*	119.4	18.0*	125.2	18.2
18	.....	.....	137.4	18.0	.....	.....
		2)18.0		36.0		36.0
		9.0		18.0		18.0
		9.0				
		9.0		9.0		9.0
		3)27.0				
		9.0 Velocity with a Motive Weight of 67 lbs.				

SATURDAY, September 12, 1795.

Parallelopipedon b, lengthened by having a circular wedge added to each extremity, called h.

System Three-fold.

Total Wt. 308 lbs. Motive Wt. 100 lbs. 8 oz.				
Accelerating Wt. 56 lbs.			Accel. Wt. 140 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	9.4	9.4	11.1	11.1
4	23.9	14.5	28.0	16.9
6	41.9	18.0	49.2	21.2
8	62.5	20.6	72.0	22.8
10	84.4	21.9	95.4	23.4
12	107.2	22.8	118.6	23.2*
14	130.4	23.2*	.....	.....
		2)23.2		23.2
		11.6		11.6
		11.6		
		2)23.2		
		11.6 Velocity with a Motive Weight of 100 lbs. 8 oz.		

Parallelopipedon a, lengthened by having a circular wedge added to each extremity, called i.

	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	
Velocity per Experiment.....	.....	.....	2.2583	3.2937	4.5750	5.9500	8.0250	9.8625	.....	
Hutt. Correction, or Regular Series.....	1.6787		2.2959	3.1388	4.2921	5.8689	8.0250	9.6369	10.973	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.6645	3.0856	7.5766	14.329	23.490	35.181	49.501	66.539	86.375	109.08	134.72	163.37	213.00
M. W. Parallelopipedon h.	0.4045	2.0277	5.2064	10.164	17.078	26.096	37.348	50.947	67.000	85.61	106.85	130.81	172.83
Friction on 77.16	0.2600	1.0579	2.3702	4.165	6.412	9.085	12.153	15.592	19.375	23.47	27.87	32.56	40.17
Law of the Friction	.....	2.0246	1.9895	1.9596	1.9335	1.9112	1.8876	1.8661	1.8443	1.8198	1.8028	1.7875	1.7535

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.		lbs. oz.																
4 3	and	8 6	1.8367															
		16 12	1.9636	8 6..	16 12	2.1094												
		33 8	2.1465		33 8	2.3442	16 12..	33 8	2.6378									
		67 0	2.1866		67 0	2.3350		67 0	2.4669	33 8..	67 0	2.3168						
		100 8	2.1559		100 8	2.2658		100 8	2.3326		100 8	2.1739	67..	100 8	1.9655			

15)33.2302

Mean 4 lbs. 3 oz. and 67 lbs. . . 2.2152

TUESDAY, September 22, 1795.

Parallelopipedon a, lengthened by having a circular wedge added to each extremity, called i.

System Three-fold.

Total Wt. 13 lbs. 4 oz. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.7	2.7	2.3	2.3
8	5.9	3.2	5.2	2.9
12	9.7	3.8	8.6	3.4
16	13.9	4.2	12.7	4.1
20	18.6	4.9	17.4	4.7
24	23.9	5.3	22.6	5.2
28	29.6	5.7	28.2	5.6
32	35.8	6.2	34.3	6.1
36	42.3	6.5	40.8	6.5
40	49.3	7.0	47.7	6.9
44	56.6	7.3	55.0	7.3
48	64.4	7.8	62.6	7.6
52	72.4	8.0	70.6	8.0
56	80.7	8.3	78.8	8.2
60	89.2	8.5	87.3	8.5
64	97.9	8.7	95.8	8.5
66	102.4	4.5	100.2	4.4
68	106.7	4.3	104.6	4.4
70	111.2	4.5	109.0	4.4
72	115.6	4.4	113.3	4.3
74	120.1	4.5	117.7	4.4
76	124.5	4.4	122.3	4.6
78	129.0	4.5	126.7	4.4
80	133.5	4.5	131.2	4.5
82	138.0	4.5*	135.7	4.5*
84	142.6	4.6	140.2	4.5
86	147.1	4.5	144.7	4.5
		3) 13.6		13.5
		2) 4.533		4.5
		2.2666		2.25
		2.2500		
		2) 4.5166		
		2.2583	Velocity with a Motive Weight of 4 lbs. 3 oz.	

† In the first experiment the Accelerating Weight came to the ground between 64 and 72 feet, and in the second experiment between 70 and 78 feet.

MONDAY, September 21, 1795.

Parallelopipedon a, lengthened by having a circular wedge added to each extremity, called i.

Thermometer in the Air, 65°;—In the Dock, 67°.—Wind East, Strong Breeze.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.4	1.4	1.4	1.4
4	3.1	1.7	3.3	1.9
6	5.2	2.1	5.6	2.3
8	7.8	2.6	8.1	2.5
10	10.6	3.8	11.1	3.0
12	13.8	3.2	14.3	3.2
14	17.3	3.5	17.9	3.6
16	21.1	3.8	21.7	3.8
18	25.1	4.0	25.9	4.2
20	29.5	4.4	30.3	4.4
22	34.2	4.7	35.0	4.7
24	39.2	5.0	40.1	5.1
26	44.3	5.1	45.3	5.2
28	49.7	5.4	50.8	5.5
30	55.3	5.6	56.2	5.4
32	61.2	5.9	62.0	5.8
34	67.3	6.1	67.8	5.8
36	73.2	6.9	73.8	6.0
38	79.6	6.4	79.7	5.9
40	86.0	6.4	85.8	6.1
42	92.4	6.4	92.0	6.2
44	98.9	6.5	98.3	6.3
46	105.4	6.5	104.7	6.4
48	111.9	6.5	111.0	6.3
50	118.5	6.6	117.4	6.4
52	125.1	6.6*	124.0	6.6*
54	131.7	6.6	130.4	6.4
56	138.3	6.6	137.0	6.6
58	145.0	6.7	143.6	6.6
		4)26.5		26.2
		2)6.625		6.55
		3.3125		3.275
		3.2750		
		2)6.5875		
		3.2937	Velocity with a Motive Weight of 8 lbs. 6 oz.	

MONDAY, September 21, 1795.

Parallelopipedon a, lengthened by having a circular wedge added to each extremity, called i.

System Three-fold.

Total Wt. 51 lbs. 8 oz.			M. W. 16 lbs. 12 oz.	
Accelerating Wt. 32 lbs.			Accel. Wt. 32 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.4	2.4	2.2	2.2
4	5.5	3.1	5.2	3.0
6	9.5	4.0	9.1	3.9
8	13.9	4.4	13.5	4.4
10	19.1	5.2	18.7	5.2
12	24.6	5.5	24.4	5.7
14	30.9	6.3	30.8	6.4
16	37.6	6.7	37.6	6.8
18	44.6	7.0	45.2	7.6
20	52.0	7.4	53.1	7.9
22	59.8	7.8	61.3	8.2
24	68.0	8.2	70.0	8.7
26	76.3	8.3	78.7	8.7
28	85.1	8.8	87.5	8.8
30	93.7	8.6	96.7	9.2
32	102.8	9.1	105.6	8.9
34	111.9	9.1*	114.8	9.2*
36	121.0	9.1	124.0	9.2
38	130.2	9.2	133.2	9.2
40	139.3	9.1	142.3	9.1
		4)36.5		36.7
		2)9.125		9.175
		4.5625		4.5875
		4.5875		
		2)9.1500		
		4.5750 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

WEDNESDAY, October 7, 1795.

Thermometer in the Air, 66°;—In the Dock, 61°.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. W. 33 lbs. 8 oz.	
Accelerating Wt. 38 lbs.			Accel. Wt. 38 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.8	2.8	3.2	3.2
4	6.8	4.0	8.0	4.8
6	12.5	5.7	13.8	5.8
8	19.0	6.5	20.8	7.0
10	26.8	7.8	28.8	8.0
12	35.3	8.5	37.8	9.0
14	44.9	9.6	47.9	10.1
16	55.2	10.3	58.3	10.1†
18	66.0	10.3	69.3	11.0
20	77.1	11.1	80.7	11.4
22	88.6	11.5	92.3	11.6
24	100.3	11.7	104.1	11.8
26	112.2	11.9	116.0	11.9
28	124.1	11.9*	127.9	11.9*
		2)11.9		11.9
		5.95		5.95
		5.95		
		2)11.90		
		5.95 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

† Query 10.4?

TUESDAY, September 22, 1795.

Parallelopipedon a, lengthened by having a circular wedge added to each extremity, called i.

System Three-fold.

Total Wt. 206 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences
2	7.1	7.1	6.7	6.7
4	17.1	10.0	16.4	9.7
6	29.2	12.1	28.3	11.9
8	43.3	14.1	42.2	13.9
10	58.5	15.2	57.2	15.0
12	74.2	15.7	73.1	15.9
14	90.1	15.9	89.0	15.9
16	106.0	15.9	105.0	16.0
18	122.0	16.0*	121.2	16.2*
20	.....	.....	137.2	16.0
		2)16.0		32.2
		8.00		2)16.1
		8.05		8.05
		2)16.05		
		8.025 Velocity with a Motive Wt. of 67 lbs. †		

MONDAY, September 21, 1795.

Thermometer in the Air, 65°;—In the Dock, 67°.
Wind East, Strong Breeze.

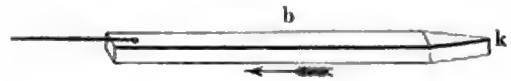
System Three-fold.

T. Wt. 306 lbs. 8 oz. M. Wt. 100 lbs. 8 oz.				
Accelerating Wt. 168 lbs.			Accel. Wt. 168 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.0	6.0	8.8	8.8
4	16.3	10.3	21.4	12.6
6	30.2	13.9	37.4	16.0
8	47.1	16.9	55.5	18.1
10	65.4	18.3	74.6	19.1
12	85.0	19.6	94.2	19.6*
14	104.8	19.8*	114.0	19.8
16	124.5	19.7	.....	.....
		2)39.5		39.4
		2)19.75		19.7
		9.875		9.85
		9.850		
		2)19.725		
		9.8625 Velocity with a M. Wt. of 100 lbs. 8 oz.		

† In the first experiment the Accelerating Weight came to the ground at 58 feet, and in the second experiment at 57 feet.

Parallelopipedon b, lengthened by having an angular wedge added to its hindmost extremity, called k.

Length of the perpendicular 3.605 feet. Oblique side 3.657 feet. Angle of incidence 9° 35′ 40″.



	Motive Weights.																			
	lbs.	oz.	drs.	lbs.	oz.	drs.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
	1	0	12	2	1	8	4	3	8	6	16	12	33	8	67	0	100	8	134	0
Velocity per Experiment									2.5350		3.5833		4.950		6.6875		8.0625		9.225	
Hutt. Correction, or Regular Series				1.3528			1.8622		2.5634		3.5289		4.8580		6.6875		8.0625		9.2064	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.0874	4.8894	11.778	21.980	35.662	52.955	93.973*	98.818	127.57	160.31	197.12	238.06	308.67†
Parallelopipedon b	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Diminution of the minus pressure by body k	0.1977	0.7472	1.607	2.743	4.133	5.755	7.593	9.632	11.84	14.24	16.81	19.45	23.86

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.														
8	6	and	16	12	2.0029													
			33	8	2.0716	16	12..	33	8	2.1453								
			67	0	2.1437			67	0	2.2218	33	8..	67	0	2.3039			
			100	8	2.1477			100	8	2.2094			100	8	2.2520	67	0..	100	8	2.1684
			134	0	2.1464			134	0	2.1990			134	0	2.2269			134	0	2.1548

100 8.. 134 | 2.1358

15)32.5296

Mean 33 lbs. 8 oz. and 100 lbs. 8 oz. 2.1686

* Query 73.973?

† Should be 308.61?

THURSDAY, October 29, 1795.

Parallelopipedon **b**, lengthened by having an angular wedge added to its hindmost extremity, called **k**.

System Three-fold.

Total Wt. 26 lbs. M. Wt. 8 lbs. 6 oz.				
Accelerating Wt. 7 lbs.			A. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.9	3.9	4.4	4.4
8	9.7	5.8	10.8	6.4
12	17.2	7.5	18.6	7.8
16	25.9	8.7	27.5	8.9
20	35.4	9.5	36.8	9.3
24	45.6	10.2	46.4	9.6
28	56.1	10.5	56.2	9.8
32	66.6	10.5	65.9	9.7
36	77.0	10.4	75.7	9.8
38	82.2	5.2	80.7	5.0
40	87.2	5.0	85.8	5.1
42	92.3	5.1	90.8	5.0
44	97.4	5.1	95.8	5.0
46	102.6	5.2	100.9	5.1
48	107.6	5.0	105.9	5.0
50	112.7	5.1	110.9	5.0
52	117.8	5.1*	116.0	5.1*
54	122.8	5.0	121.0	5.0
56	127.9	5.1	126.1	5.1
58	133.0	5.1	131.1	5.0
60	138.1	5.1	136.2	5.1
		5)25.4		25.3
		2)5.08		5.06
		2.54		2.53
		2.53		
		2)5.07		
Velocity with a Motive Weight of 8 lbs. 6 oz...		2.535		

THURSDAY, October 29, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to its hindmost extremity, called k.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 14 lbs.			A. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.1	3.1	2.6	2.6	2.0	2.0
4	7.4	4.3	6.2	3.6	5.2	3.2
6	12.4	5.0	10.8	4.6	9.4	4.2
8	18.1	5.7	16.2	5.4	14.4	5.0
10	24.4	6.3	22.1	5.9	20.0	5.6
12	31.2	6.8	28.6	6.5	26.2	6.2
14	38.2	7.0	35.4	6.8	32.8	6.6
16	45.6	7.4	42.6	7.2	39.7	6.9
18	52.8	7.2	49.7	7.1	47.0	7.3
20	60.1	7.3	57.1	7.4	54.2	7.2
22	67.3	7.2	64.4	7.3	61.5	7.3
24	74.4	7.1	71.6	7.2	68.7	7.2
26	81.6	7.2	78.7	7.1	75.9	7.2
28	88.7	7.1	85.9	7.2	83.0	7.1
30	95.9	7.2*	93.1	7.2	90.2	7.2
32	103.1	7.2	103.0	7.2*	97.4	7.2*
34	110.3	7.2	107.4	7.1	104.6	7.2
36	117.4	7.1	114.6	7.2	111.7	7.1
38	124.6	7.2	121.7	7.1	118.9	7.2
40	.....	.....	128.9	7.2	126.0	7.1
		5)35.9		35.8		35.8
		2)7.18		7.16		7.16
		3.59		3.58		3.58
				3.59		
				3.58		
				3)10.75		
				3.5833 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

WEDNESDAY, October 28, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to its hindmost extremity, called k.

Thermometer in the Air, 56°;—In the Dock, 55°.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. W. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.3	3.3	3.3	3.3
4	8.3	5.0	8.4	5.1
6	14.6	6.3	14.8	6.4
8	22.1	7.5	22.4	7.6
10	30.3	8.2	30.7	8.3
12	39.1	8.8	39.5	8.8
14	48.2	9.1	48.7	9.2
16	57.6	9.4	58.1	9.4
18	67.1	9.5	67.6	9.5
20	76.7	9.6	77.3	9.7
22	86.5	9.8	87.1	9.8
24	96.2	9.7	96.8	9.7
26	106.1	9.9	106.8	10.0
28	115.9	9.8*	116.7	9.9*
30	125.9	10.0	126.6	9.9
32	135.8	9.9	.....	.....
		3)29.7		2)19.8
		2)9.9		9.9
		4.95		4.95
		4.95		
		2)9.90		
		4.95 Velocity with a M. W. of 33 lbs. 8 oz.		

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accel. Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	9.0	9.0	5.9	5.9
4	20.1	11.1	15.0	9.1
6	32.6	12.5	26.3	11.3
8	45.7	13.1	38.7	12.4
10	58.9	13.2	51.9	13.2
12	72.0	13.1	65.0	13.1
14	85.2	13.2	78.2	13.2
16	98.4	13.2	91.2	13.0
18	111.7	13.3*	104.5	13.3
20	125.1	13.4	117.9	13.4*
22	.....	.....	131.3	13.4
		2)26.7		26.8
		2)13.35		13.4
		6.675		6.7
		6.700		
		2)13.375		
		6.6875 Velocity with a Motive Weight of 67 lbs.		

TUESDAY, October 27, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to its hindmost extremity, called k.

Thermometer in the Air, 55°;—In the Dock, 58°.—Wind, S.W. Fresh Breeze.

System Three-fold.

Total Wt. 307 lbs. 8 oz. M. Wt. 100 lbs. 8 oz.				
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.0	8.0	8.5	8.5
4	20.3	12.3	21.2	12.7
6	34.8	14.5	36.1	14.9
8	50.1	15.3	51.8	15.7
10	65.6	15.5	67.7	15.9
12	81.3	15.7	83.5	15.8
14	97.2	15.9	99.5	16.0
16	113.4	16.2*	115.5	16.0*
18	129.6	16.2	131.6	16.1
		2)32.4		32.1
		2)16.2		16.05
		8.100		8.025
		8.025		
		2)16.1250		
		8.0625 Velocity with a M. W. of 100 lbs. 8 oz.		

Thermometer in the Air, 56°;—In the Dock, 55°.

System Three-fold.

Total Wt. 410 lbs. Motive Wt. 134 lbs.				
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	12.1	12.1	11.5	11.5
4	28.3	16.2	27.5	16.0
6	46.0	17.7	45.1	17.6
8	64.2	18.2	63.2	18.1
10	82.6	18.4	81.4	18.2
12	101.1	18.5*	99.8	18.4*
14	.....	.....	118.2	18.4
		2)18.5		2)36.8
		9.25		18.4
		9.20		9.2
		2)18.450		
		9.225 Velocity with a Motive Weight of 134 lbs.		

Parallelopipedon b, lengthened by having an angular wedge added to its foremost extremity, called l.

Angle of incidence 9° 35′ 40″.

	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	
Velocity per Experiment	.....	... .	2.6625	3.6583	5.0583	6.5375	8.8125	11.2625	.....	
Hutt. Correction, or Regular Series	.....	2.0116	2.7383	3.7275	5.0743	6.9074	9.4029	11.2625	12.800	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.43527	2.0668	5.1412	9.8133	16.204	24.411	34.518	46.598	60.720	76.943	95.322	115.91	151.71
Parallelopipedon b	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Diminution of the plus pressure by body l ..	0.8498	3.5698	8.2438	14.9097	23.591	34.299	47.048	61.852	78.69	97.607	118.600	141.60	180.76

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.		lbs. oz.																
4 3	and	8 6	2.1815															
		16 12	2.1601	8 6	..	16 12	2.1392											
		33 8	2.3149			33 8	2.3879	16 12	..	33 8	2.7020							
		67 0	2.3164			67 0	2.3652			67 0	2.4973	33 8	..	67 0	2.3212			
		100 8	2.2036			100 8	2.2099			100 8	2.2386			100 8	2.0200	67	..	100 8	1.6533

15)33.7111

Mean 16 lbs. 12 oz. and 100 lbs. 8 oz... 2.2474

MONDAY, October 26, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to its foremost extremity, called 1.

Thermometer in the Air, 55°;—In the Dock, 55°.

System Three-fold.

Total Wt. 13 lbs.	Motive Wt. 4 lbs. 3 oz.			
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	1.8	1.8	2.2	2.2
8	5.0	3.2	5.8	3.6
12	9.5	4.5	10.8	5.0
16	15.3	5.8	17.2	6.4
20	22.3	7.0	24.5	7.3
24	30.3	8.0	32.8	8.3
28	39.2	8.7	42.1	9.3
32	48.9	9.7	51.9	9.8
36	59.3	10.4	61.9	10.0
40	69.8	10.5	72.2	10.3
44	80.4	10.6	82.6	10.4
48	91.1	10.7	93.0	10.4
52	101.8	10.7	103.4	10.4
54	107.2	5.4	108.7	5.3
56	112.6	5.4	114.0	5.3
58	117.9	5.3*	119.3	5.3*
60	123.3	5.4	124.6	5.3
62	128.6	5.3	129.9	5.3
64	134.0	5.4	135.2	5.3
		4)21.4		21.2
		2)5.35		5.3
		2.675		2.65
		2.650		
		2)5.325		
		2.6625 Velocity with a Motive Weight of 4 lbs. 3 oz.		

System Three-fold.

Total Wt. 26 lbs.	Motive Wt. 8 lbs. 6 oz.			
Accelerating Wt. 11 lbs.			Accel. Wt. 11 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	6.0	6.0	3.0	3.0
8	14.4	8.4	8.7	5.7
12	24.7	10.3	16.6	7.9
16	36.6	11.9	26.5	9.9
20	49.8	13.2	38.1	11.6
24	63.5	13.7	51.0	12.9
28	77.6	14.1	64.6	13.6
30	84.6	7.0	78.6	14.0
32	91.7	7.1	85.7	7.1
34	99.0	7.3	92.8	7.1
36	106.2	7.2	100.0	7.2
38	113.5	7.3*	107.2	7.2
40	120.8	7.3	114.5	7.3*
42	128.2	7.4	121.8	7.3
44	.....	.....	129.1	7.3
		3)22.0		21.9
		2)7.3333		7.3
		3.6666		3.65
		3.6500		
		2)7.3166		
		3.6583 Velocity with a M. W. of 8 lbs. 6 oz.		

MONDAY, October 26, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to its foremost extremity, called l.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.8	2.8	2.0	2.0	2.9	2.9
4	6.8	4.0	5.2	3.2	6.9	4.0
6	11.8	5.0	9.6	4.4	11.9	5.0
8	17.9	6.1	14.8	5.2	17.8	5.9
10	24.8	6.9	21.0	6.2	24.7	6.9
12	32.4	7.6	28.0	7.0	32.3	7.6
14	40.7	8.3	35.7	7.7	40.5	8.2
16	49.3	8.6	44.1	8.4	49.3	8.8
18	58.4	9.6	53.0	8.9	58.4	9.1
20	67.7	9.3	62.2	9.2	67.9	9.5
22	77.2	9.5	71.6	9.4	77.6	9.7
24	86.8	9.6	81.3	9.7	87.4	9.8
26	96.7	9.9	91.1	9.8	97.3	9.9
28	106.7	10.0	101.0	9.9	107.3	10.0
30	116.8	10.1*	111.1	10.1*	117.4	10.1*
32	127.0	10.2	121.2	10.1	127.5	10.1
		2)20.3		20.2		20.2
		2)10.15		10.1		10.1
		5.075		5.05		5.05
		5.050				
		5.050				
		3)15.175				
		5.0583 Velocity with a Motive Weight of 16 lbs. 12 oz.				

MONDAY, October 26, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to its foremost extremity, called l.

System Three-fold.

T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.9	2.9	3.1	3.1
4	8.0	5.1	8.1	5.0
6	14.8	6.8	15.0	6.9
8	23.5	8.7	23.6	8.6
10	33.6	10.1	33.8	10.2
12	44.8	11.2	45.0	11.2
14	56.7	11.9	57.2	12.2
16	69.4	12.7	69.7	12.5
18	82.2	12.8	82.7	13.0
20	95.0	12.9	95.6	12.9
22	108.0	13.0	108.6	13.0
24	121.1	13.1*	121.7	13.1*
26	134.1	13.0	134.8	13.1
		2)26.1		26.2
		2)13.05		13.1
		6.525		6.55
		6.550		
		2)13.075		
		6.5375 Velocity with a Motive Weight of 33 lbs. 8 oz.		

TUESDAY, October 27, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to its foremost extremity, called l.

Thermometer in the Air, 55°;—In the Dock, 58°.—
Wind, S.W. Fresh Breeze.

System Three-fold.

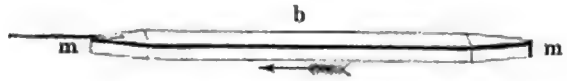
Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.4	6.4	5.8	5.8
4	16.8	10.4	15.7	9.9
6	31.0	14.2	29.3	13.6
8	47.2	16.2	45.2	15.9
10	64.3	17.1	62.1	16.9
12	81.7	17.4	79.4	17.3
14	99.3	17.6	96.9	17.5
16	116.9	17.6*	114.5	17.6*
18	.....	.....	132.2	17.7
		2)17.6		2)35.3
		8.800		17.65
		8.825		8.825
		2)17.625		
		8.8125 Velocity with a M. Wt. of 67 lbs.		

System Three-fold.

Total Wt. 307 lbs. 8 oz. M. Wt. 100 lbs. 8 oz.				
Accel. Wt. 140 lbs.			Accel. Wt. 140 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.7	8.7	8.2	8.2
4	24.5	15.8	24.0	15.8
6	45.1	20.6	44.2	20.2
8	67.5	22.4	66.6	22.4
10	99.9	22.4	88.9	22.3
12	112.5	22.6*	111.4	22.5*
14	.....	.....	133.8	22.4
		2)22.6		2)44.9
		11.300		22.45
		11.225		11.225
		2)22.525		
		11.2625 Velocity with a Motive Wt. of 100 lbs. 8 oz.		

Parallelopipedon b, lengthened by having an angular wedge added to each extremity, called m.

Angle of Incidence, 9° 35′ 40″.



	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment	.....	.....	2.8875	4.0250	5.5083	7.0500	9.4000	12.1166	.....
Hutt. Correction, or Regular Series	.....	2.2213	3.0097	4.0779	5.5256	7.4886	10.144	12.1166	13.761

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.3388	1.6479	4.1568	8.0144	13.334	20.214	28.736	38.974	50.991	64.849	80.599	98.300	129.20
Diminution by bodies b and m b m	0.9463	3.9887	9.2280	16.709	26.461	38.496	52.830	69.48	88.42	109.70	133.33	159.21	203.27
Diminution of the plus and minus pressure by bodies k and l	1.0475	4.3170	9.851	17.653	27.724	40.054	54.641	71.484	90.530	111.847	135.41	161.05	204.62

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.												
4 3 and	8 6	2.0870											
	16 12	2.1464	8 6..16 12	2.2093									
	33 8	2.3295	33 8	2.4733	16 12..33 8	2.8089							
	67 0	2.3489	67 0	2.4516	67 0	2.5939	33 8..67 0	2.4094					
	100 8	2.2159	100 8	2.2548	100 8	2.2727	100 8	2.0285	67..100 8	1.5969			

15)34.2270

Mean 16 lbs. 12 oz. and 108 lbs. 8 oz... 2.2818

FRIDAY, October 23, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to each extremity, called m.

Thermometer in the Air, 55½°.—Wind, West, Fresh Breeze.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. 2 lbs.			Accel. Wt. 2 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.3	3.3	3.0	3.0
8	7.7	4.4	7.2	4.2
12	13.1	5.4	12.2	5.0
16	19.4	6.3	18.3	6.1
20	26.5	7.1	25.0	6.7
24	34.4	7.9	32.6	7.6
28	42.9	8.5	41.0	8.4
32	52.1	9.2	49.9	8.9
36	61.7	9.6	59.4	9.5
40	71.7	10.0	69.1	9.7
44	81.9	10.2	79.4	10.3
48	92.5	10.6	90.0	10.6
50	98.0	5.5	95.3	5.3
52	103.4	5.4	100.8	5.5
54	109.0	5.6	106.3	5.5
56	114.6	5.6	111.9	5.6
58	120.3	5.7	117.4	5.5
60	125.9	5.6	123.1	5.7
62	131.6	5.7*	128.8	5.7
64	137.4	5.8	134.6	5.8*
66	.....	.....	140.4	5.8
	2)11.5			11.6
	2)5.75			5.8
	2.875			2.9
	2.900			
	2)5.775			
	2.8875 Velocity with a Motive Weight of 4 lbs. 3 oz.			

FRIDAY, October 23, 1795.

Parallelopipedon **b**, lengthened by having an angular wedge added to each extremity, called **m**.

System Three-fold.

Total Weight 26 lbs. Motive Weight 8 lbs. 6 oz.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 11 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.7	1.7	1.6	1.6	2.9	2.9
4	4.1	2.4	3.8	2.2	6.5	3.6
6	7.0	2.9	6.6	2.8	10.6	4.1
8	10.4	3.4	10.0	3.4	15.2	4.6
10	14.3	3.9	13.8	3.8	20.5	5.3
12	18.7	4.4	18.0	4.2	26.3	5.8
14	23.7	5.0	22.8	4.8	32.3	6.0
16	29.1	5.4	28.1	5.3	38.9	6.6
18	34.8	5.7	33.9	5.8	45.8	6.9
20	40.9	6.1	40.0	6.1	52.8	7.0
22	47.5	6.6	46.4	6.4	60.3	7.5
24	54.3	6.8	53.3	6.9	67.7	7.4
26	61.3	7.0	60.3	7.0	75.4	7.7
28	68.4	7.1	67.6	7.3	83.2	7.8
30	75.8	7.4	74.9	7.3	91.1	7.9
32	83.4	7.6	82.5	7.6	99.1	8.0
34	91.0	7.6	90.1	7.6	107.1	8.0*
36	98.7	7.7	97.8	7.7	115.3	8.2
38	106.7	8.0*	105.8	8.0*	123.4	8.1
40	114.5	7.8	113.7	7.9	131.7	8.3
42	122.4	7.9	121.8	8.1		
44	130.5	8.1	129.8	8.0		4)32.6
46	138.6	8.1	137.9	8.1		8.15
		5)39.9		40.1		4.075
		2)7.98		8.02		4.010
		3.99		4.01		3.990
						2)12.075
						4.025 Velocity with a Motive Wt. of 8 lbs. 6 oz.

FRIDAY, October 23, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to each extremity, called m.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.8	3.8	3.4	3.4
4	8.7	4.9	8.2	4.8
6	15.4	6.7	14.2	6.0
8	23.1	7.7	21.6	7.4
10	31.5	8.4	29.9	8.3
12	41.0	9.5	39.0	9.1
14	51.0	10.0	48.8	9.8
16	61.2	10.2	58.9	10.1
18	71.8	10.6	69.4	10.5
20	82.5	10.7	80.2	10.8
22	93.5	11.0	90.8	10.6
24	104.4	10.9*	101.9	11.1*
26	115.4	11.0	112.9	11.0
28	126.5	11.1	123.9	11.0
		3)33.0		33.1
		2)11.0		11.033
		5.5000		5.5166
		5.5166		
		2)11.0166		
		5.5083 Velocity with a Motive Weight of 16 lbs. 12 oz.		

FRIDAY, October 23, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to each extremity, called m.

Thermometer in the Air, 53½°.—Wind, S.W. Fresh Breeze.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accel. Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.5	6.5	5.4	5.4
4	15.7	9.2	13.5	8.1
6	26.9	11.2	24.1	10.6
8	40.0	13.1	36.4	12.3
10	53.6	13.6	50.0	13.6
12	67.4	13.8	64.0	14.0
14	81.3	13.9	78.2	14.2
16	95.3	14.0	92.2	14.0
18	109.3	14.0*	106.3	14.1*
20	123.5	14.2	120.4	14.1
		2)28.2		28.2
		2)14.1		14.1
		7.05		7.05
		7.05		
		2)14.10		
		7.05 Velocity with a M. W. of 33 lbs. 8 oz.		

System Three-fold.

Total Wt. 207 lbs.			Motive Wt. 67 lbs.	
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.1	7.1	6.6	6.6
4	18.9	11.8	18.3	11.7
6	34.4	15.5	33.6	15.3
8	52.1	17.7	51.3	17.7
10	70.8	18.7	69.8	18.5
12	89.6	18.8	88.4	18.6
14	108.4	18.8*	107.2	18.8*
16	.....	.....	126.0	18.8
		2)18.8		2)37.6
		9.4		18.8
		9.4		9.4
		2)18.8		
		9.4 Velocity with a Motive Weight of 67 lbs.		

FRIDAY, October 30, 1795.

Parallelopipedon b, lengthened by having an angular wedge added to each extremity, called m.

Thermometer in the Air, 51°;—In the Dock 53°.—Wind, S.W. Fresh Breeze.

System Three-fold.

Total Weight 307 lbs. 8 oz. Motive Weight 100 lbs. 8 oz.						
Accel. Wt. 168 lbs.			A. Wt. 168 lbs.		A. Wt. 168 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	11.8	11.8	11.8	11.8	13.5	13.5
4	30.2	18.4	30.9	19.1	33.7	20.2
6	52.8	22.6	53.7	22.8	57.0	23.3
8	76.4	23.6	77.6	23.9	80.8	23.8
10	100.4	24.0	101.8	24.2	105.0	24.2*
12	124.5	24.1*	126.2	24.4*	.....	.....
		2)24.1		24.4		24.2
		12.05		12.20		12.1
				12.05		
				12.10		
				3)36.3500		
				12.1166 Velocity with a M. Wt. of 100 lbs. 8 oz.		

Parallelopipedon b, lengthened by having an inclined plane added to its hindmost extremity, called n.

Oblique side r n = 7.314 feet. Angle of incidence 9° 35′ 40″.

	Motive Weights.													
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment	.....	.....	.....	2.4791	3.5000	4.9083	6.7500	8.2166	9.4000
Hutt. Correction, or Regular Series		1.2867	1.7924	2.4967	3.4777	4.8444	6.7482	8.1919	9.4000

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.2359	5.2664	12.297	22.443	35.789	52.402	72.336	95.639	122.35	152.51	186.15	223.30	286.86
Parallelopipedon b	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Diminution of the minus pressure by body n..	0.0492	0.3702	1.088	2.280	4.006	6.308	9.230	12.811	17.06	22.04	27.78	34.21	45.61

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.	lbs.	oz.																
8	6 and	16	12	2.0100															
		33	8	2.0296	16	12..	33	8	2.0498										
		67	0	2.0760			67	0	2.1108	33	8..	67	0	2.1756					
		100	8	2.0738			100	8	2.0996			100	8	2.1323	67	0..	100	8	2.0622
		134	0	2.0803			134	0	2.1048			134	0	2.1334			134	0	2.0931

100 8.. 134 | 2.1381

15)31.3694

Mean 67 lbs. and 134 lbs.. 2.0913

MONDAY, November 16, 1795.

Parallelopipedon b, lengthened by having an inclined plane added to its hindmost extremity, called n.

N. B. The oblique side of the inclined plane is equal to the sum of the sides of the angular wedge, viz. 7.314 feet.

Thermometer in the Air, 38½°;—In the Dock, 43°.—Wind, W.S.W. Light Breeze.

System Three-fold.

Total Weight 26 lbs. Motive Weight 8 lbs. 6 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.0	3.0	2.8	2.8	3.0	3.0
8	7.7	4.7	7.2	4.4	7.5	4.5
12	13.6	5.9	12.9	5.7	13.3	5.8
16	20.6	7.0	19.7	6.8	20.2	6.9
20	28.4	7.8	27.2	7.5	27.8	7.6
24	36.8	8.4	35.2	8.0	36.0	8.2
28	45.6	8.8	44.0	8.8	44.6	8.6
32	54.7	9.1	52.9	8.9	53.6	9.0
36	64.1	9.4	62.1	9.2	62.8	9.2
40	73.6	9.5	71.5	9.4	72.1	9.3
44	83.3	9.7	80.9	9.4	82.1	10.0
48	93.0	9.7	90.6	9.7	91.3	9.2
52	102.7	9.7	100.3	9.7	101.0	9.7
54	107.7	5.0	105.1	4.8	105.9	4.9
56	112.7	5.0	110.0	4.9	110.8	4.9
58	117.5	4.8	114.9	4.9	115.8	5.0
60	122.5	5.0*	119.8	4.9	120.7	4.9
62	127.5	5.0	124.4†	5.0*	125.7	5.0*
64	132.4	4.9	129.7	4.9	130.6	4.9
66	137.4	5.0	134.7	5.0	135.6	5.0
68	.....	.....	139.6	4.9	140.5	4.9
		4)19.9		19.8		19.8
		2)4.9750		4.95		4.95
		2.4875		2.4750		2.475
				2.4750		
				2.4875		
				3)7.4375		
				2.4791 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

† Query 124.8?

MONDAY, November 16, 1795.

Parallelopipedon b, lengthened by having an inclined plane added to its hindmost extremity, called n.

System Three-fold.

Total Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.7	4.7	5.0	5.0
8	12.4	7.7	12.9	7.9
12	22.2	9.8	22.9	10.0
16	33.4	11.2	34.4	11.5
20	45.7	12.3	46.8	12.4
24	58.6	12.9	59.8	13.0
28	71.8	13.2	73.2	13.4
32	85.4	13.6	86.8	13.6
36	99.3	13.9	100.7	13.9
38	106.1	6.8	107.6	6.9
40	113.2	7.1*	114.6	7.0*
42	120.1	6.9	121.6	7.0
44	127.1	7.0	128.6	7.0
46	134.1	7.0	135.6	7.0
		4)28.0		28.0
		2)7.0		7.0
		3.5		3.5
		3.5		
		2)7.0		
		3.5 Velocity with a M. Wt. of 16 lbs. 12 oz.		

System Three-fold.

Total Wt. 102 lbs. 8oz.			M. W. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.9	2.9	2.6	2.6
4	7.4	4.5	6.8	4.2
6	13.4	6.0	12.6	5.8
8	20.5	7.1	19.5	6.9
10	28.3	7.8	27.2	7.7
12	36.8	8.5	35.6	8.4
14	45.8	9.0	44.4	8.8
16	55.1	9.3	53.6	9.2
18	64.5	9.4	62.9	8.3
20	74.2	9.7	72.6	9.7
22	83.9	9.7	82.3	9.7
24	93.7	9.8	92.1	9.8
26	103.5	9.8	101.8	9.7
28	113.3	9.8*	111.6	9.8*
30	123.1	9.8	121.4	9.8
32	.....	.....	131.3	9.9
		2)19.6		3)29.5
		2)9.8		9.8330
		4.9000		4.9166
		4.9166		
		2)9.8166		
		4.9083 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

MONDAY, November 16, 1795.

Parallelopipedon b, lengthened by having an inclined plane added to its hindmost extremity, called n.

System Three-fold.

Total Weight 207 lbs.			Motive Wt. 67 lbs.	
Accel. Weight 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet	Differences.	Feet.	Differences.
2	6.0	6.0	5.8	5.8
4	15.0	9.0	14.8	9.0
6	26.1	11.1	25.9	11.1
8	38.4	12.3	38.2	12.3
10	51.2	12.8	51.0	12.8
12	64.0	12.8	63.9	12.9
14	77.1	13.1	76.9	13.0
16	90.3	13.2	90.1	13.2
18	103.7	13.4	103.4	13.3
20	117.2	13.5	116.9	13.5
22	130.7	13.5*	130.4	13.5*
		2) 13.5		13.5
		6.75		6.75
		6.75		
		2) 13.50		
		6.75 Velocity with a Motive Weight of 67lbs.		

MONDAY, November 16, 1795.

Parallelopipedon **b**, lengthened by having an inclined plane fixed to its hindmost extremity, called **n**.

System Three-fold.

Total Weight 307 lbs. Motive Weight 100 lbs. 8 oz.						
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.		Accel. Wt. 126 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.7	8.7	9.1	9.1	9.2	9.2
4	22.7	14.0	23.3	14.2	23.6	14.4
6	38.5	15.8	39.6	16.3	40.5	16.9
8	54.8	16.3	55.9	16.3	57.4	16.9
10	71.0	16.2	72.0	16.1	74.0	16.6
12	87.2	16.2	88.3	16.3	90.3	16.3
14	103.6	16.4*	104.6	16.3*	106.8	16.5*
16	120.0	16.4	121.2	16.6	123.2	16.4
		2)32.8		32.9		32.9
		2)16.4		16.45		16.45
		8.200		8.225		8.225
		8.225				
		8.225				
		3)24.650				
		8.2166 Velocity with a Motive Weight of 100 lbs. 8 oz.				

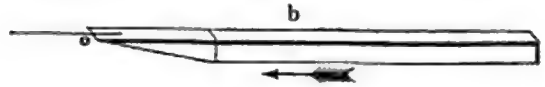
MONDAY, November 16, 1795.

Parallelopipedon b, lengthened by having an inclined plane fixed to its hindmost extremity, called n.

System Three-fold.

Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.8	8.8	9.9	9.9
4	20.1	11.3	25.5	15.6
6	37.1	17.0	43.7	18.2
8	55.9	18.8	62.3	18.6
10	75.0	19.1	80.9	18.6
12	93.7	18.7	99.7	18.8
14	112.5	18.8*	118.5	18.8*
		2)18.8		18.8
		9.4		9.4
		9.4		
		2)18.8		
		9.4	Velocity with a Motive Weight of 134 lbs.	

Parallelopipedon b, lengthened by having an inclined plane fixed to its foremost extremity, called o.
Oblique side foremost. Angle of incidence 9° 35′ 40″.



	Motive Weights.												
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment.....	.....	.....	2.4500	3.6500	5.0375	6.8250	9.5125	.....	.....
Hutt. Correction, or Regular Series.....		1.8008	2.5123	3.5044	4.8885	6.8192	9.5125	11.557	13.269

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.61496	2.6045	6.0596	11.031	17.556	25.663	35.375	46.716	59.702	74.349	90.672	108.69	139.48
Parallelopipedon b.....	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	39.41	174.55	213.93	257.51	332.47
Diminution of the plus pressure by body o..	0.6701	3.0321	7.3254	13.692	22.239	33.047	46.191	61.734	79.708	100.201	123.258	148.82	192.99

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.										
4 3 and	8 6	1.7387	8 6..	16 12	2.1515	16 12..	33 8	2.2825	33 8..	67 0	2.0877
	16 12	1.9232									
	33 8	2.0297		33 8	2.2150						
	67 0	2.0439		67 0	2.1709		67 0	2.1807			

10)20.8238

Mean 33 lbs. 8 oz. and 67 lbs... 2.0824

TUESDAY, November 17, 1795.

Parallelopipedon **b**, lengthened by having an inclined plane fixed to its foremost extremity, called **o**.

Thermometer in the Air, 47°;—In the Dock 44½°.—Wind, W. S. W. Moderate.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.8	2.8	2.8	2.8
8	7.0	4.2	7.0	4.2
12	12.3	5.3	12.3	5.3
16	18.8	6.5	18.7	6.4
20	26.1	7.3	26.0	7.3
24	34.0	7.9	33.7	7.7
28	42.8	8.8	42.4	8.7
32	51.6	8.8	51.0	8.6
36	60.6	9.0	60.0	9.0
40	69.8	9.2	69.0	9.0
44	79.2	9.4	78.2	9.2
48	88.6	9.4	87.5	9.3
50	93.4	4.8	92.2	4.7
52	98.3	4.9	97.0	4.8
54	103.1	4.8	101.8	4.8
56	108.0	4.9	106.6	4.8
58	112.9	4.9	111.4	4.8
60	117.8	4.9	116.2	4.8
62	122.7	4.9	121.1	4.9
64	127.6	4.9*	126.0	4.9*
		2)4.9		4.9
		2.45		2.45
		2.45		
		2)4.90		
		2.45	Velocity with a Motive Weight of 4 lbs. 3 oz.	

TUESDAY, November 17, 1795.

Parallelopipedon b, lengthened by having an inclined plane fixed to its foremost extremity, called o.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 21 lbs.			Accel. Wt. 21 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.8	3.8	3.5	3.5
8	10.6	6.8	10.1	6.6
12	19.9	9.3	19.3	9.2
16	31.5	11.6	30.7	11.4
20	44.8	13.3	44.0	13.3
24	59.1	14.3	58.1	14.1
28	73.7	14.6	72.8	14.7
32	88.2	14.5	87.4	14.6
34	95.6	7.4	102.0	14.6
36	102.9	7.3	109.3	7.3
38	110.2	7.3	116.6	7.3
40	117.5	7.3	123.9	7.3
42	124.8	7.3	131.2	7.3*
44	132.1	7.3*	.....	.....
		2)7.3		7.3
		3.65		3.65
		3.65		
		2)7.30		
		3.65	Velocity with a Motive Wt. of 8 lbs. 6 oz.	

System Three-fold.

Total Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.				
Accelerating Wt. 34 lbs.			Accel. Wt. 34 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.2	2.2	2.3	2.3
4	5.7	3.5	6.0	3.7
6	10.7	5.0	11.1	5.1
8	16.9	6.2	17.4	6.3
10	24.2	7.3	24.7	7.3
12	32.5	8.3	33.0	8.3
14	41.6	9.1	42.2	9.2
16	51.1	9.5	51.5	9.3
18	60.8	9.7	61.5	10.0
20	70.7	9.9	71.4	9.9
22	80.7	10.0	81.4	10.0
24	90.6	9.9	91.3	9.9
26	100.6	10.0	101.5	10.2
28	110.6	10.0	111.5	10.0
30	120.7	10.1*	121.6	10.1*
32	130.7	10.0	131.7	10.1
		2)20.1		20.2
		2)10.05		10.1
		5.025		5.05
		5.050		
		2)10.075		
		5.0375	Velocity with a M. Wt. of 16 lbs. 12 oz.	

TUESDAY, November 17, 1795.

Parallelopipedon b, lengthened by having an inclined plane fixed to its foremost extremity, called o.

System Three-fold.

T. Wt. 102 lbs. 8 oz. M. Wt. 33 lbs. 8 oz.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.2	5.2	4.3	4.3
4	12.7	7.5	11.1	6.8
6	22.6	9.9	20.1	9.0
8	34.1	11.5	31.1	11.0
10	46.2	12.1	43.6	12.5
12	59.9	12.7	56.2	12.6
14	73.4	13.5	69.7	13.5
16	86.8	13.4	83.2	13.5
18	100.4	13.6	96.7	13.5
20	114.0	13.6	110.4	13.7
22	127.6	13.6*	124.1	13.7*
		2)13.6		13.7
		6.80		6.85
		6.85		
		2)13.65		
		6.825 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

MONDAY, November, 16, 1795.

Thermometer in the Air, 38¼°;—In the Water, 43°.—Wind, W. S. W. Light Airs.

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 168 lbs.			Accel. Wt. 168 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.9	7.9	3.8	3.8
4	21.2	13.3	13.7	9.9
6	38.6	17.4	28.6	14.9
8	57.4	18.8	46.8	18.2
10	76.4	19.0	65.9	19.1
12	95.4	19.0	84.8	18.9
14	114.3	18.9*	103.9	19.1*
16	133.3	19.0	123.0	19.1
		2)37.9		38.2
		2)18.95		19.1
		9.475		9.55
		9.550		
		2)19.025		
		9.5125 Velocity with a M. Wt. of 67 lbs.		

Parallelopipedon b, lengthened by having an inclined plane added to each extremity, called p.

Angle of Incidence, 9° 35′ 40″.

	Motive Weights.																			
	lbs.	oz.	drs.	lbs.	oz.	drs.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
	1	0	12	2	1	8	4	3	8	6	16	12	33	8	67	0	100	8	134	0
Velocity per Experiment	.....			.....			2.7833		4.0416		5.5500		7.7875		10.6875		.....		.....	
Hutt. Correction, or Regular Series	.....			2.0092			2.8069		3.9208		5.4769		7.6506		10.6875		12.995		14.929	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.49275	2.0735	4.8073	8.7298	13.866	20.239	27.862	36.752	46.919	58.376	71.133	85.199	109.23
Diminution by bodies n and o	0.7924	3.5631	8.578	15.993	25.929	38.471	53.704	71.70	92.49	116.17	142.80	172.31	223.24
Diminution of plus and minus press. by bodies n and o.	0.7193	3.4023	8.413	15.972	26.245	39.355	55.421	74.545	96.77	122.24	151.04	183.03	238.60

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.																
4	3	and	8	6	1.8583															
			16	12	2.0086	8	6..	16	12	2.1855										
			33	8	2.0210			33	8	2.1137	16	12..	33	8	2.0464					
			67	0	2.0608			67	0	2.1385			67	0	2.1157	33	8..	67	0	2.1900

10)20.7385

Mean 4 lbs. 3 oz. and 67 lbs.. 2.0738

SATURDAY, November 14, 1795.

Parallelopipedon b, lengthened by having an inclined plane added to each extremity, called p.

Thermometer in the Air, 41°;—In the Dock, 46°.—Wind, N.E. Moderate.

System Three-fold.

Total Weight 13 lbs. Motive Weight 4 lbs. 3 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.0	2.0	2.7	2.7	3.0	3.0
8	5.6	3.6	7.0	4.3	7.6	4.6
12	10.8	5.2	12.8	5.8	13.7	6.1
16	17.8	7.0	20.0	7.2	21.3	7.6
20	25.9	8.1	28.5	8.5	30.1	8.8
24	35.4	9.5	38.3	9.8	40.1	10.0
28	46.0	10.6	48.4	10.1	50.6	10.5
32	56.8	10.8	59.6	11.2	61.6	11.0
36	67.9	11.1	70.7	11.1	72.6	11.0
40	79.0	11.1	81.6	10.9	83.6	11.0
44	90.1	11.1	87.0	5.4	89.1	5.5
46	95.8	5.7	92.5	5.5	94.6	5.5
48	101.4	5.6	98.0	5.5	100.2	5.6
50	107.0	5.6	103.6	5.6	105.8	5.6
52	112.5	5.5	109.2	5.6	111.3	5.5
54	118.1	5.6*	114.7	5.5*	116.9	5.6*
56	123.7	5.6	120.3	5.6	122.4	5.5
58	129.3	5.6	125.8	5.5	128.0	5.6
60	135.0	5.7	131.3	5.5	133.5	5.5
		4)22.5		22.1		22.2
		2)5.6250		5.5250		5.550
		2.8125		2.7625		2.775
		2.7625				
		2.7750				
		3)8.3500				
		2.7833 Velocity with a Motive Weight of 4 lbs. 3 oz.				

SATURDAY, November 14, 1795.

Parallelopipedon b, lengthened by having an inclined plane added to each extremity, called p.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.9	3.9	4.8	4.8
8	11.1	7.2	12.7	7.9
12	21.2	10.1	23.6	10.9
16	34.0	12.8	37.1	13.5
20	48.8	14.8	52.1	15.0
24	64.4	15.6	67.7	15.6
28	80.2	15.8	83.6	15.9
30	88.1	7.9	91.5	7.9
32	96.0	7.9	99.5	8.0
34	104.0	8.0	107.4	7.9
36	111.9	7.9	115.5	8.1
38	119.9	8.0*	123.6	8.1*
40	127.9	8.0	131.7	8.1
42	136.1	8.2	.....	.....
		3)24.2		2)16.2
		2)8.066		8.1
		4.033		4.05
		4.050		
		2)8.0830		
		4.0416 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

System Three-fold.

Total Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.3	3.3	2.5	2.5
4	8.2	4.9	6.8	4.3
6	14.7	6.5	12.7	5.9
8	22.6	7.9	20.1	7.4
10	31.8	9.2	28.9	8.8
12	41.5	9.7	38.0	9.1
14	51.7	10.2	48.7	10.7
16	62.2	10.5	59.2	10.5
18	72.9	10.7	69.7	10.5
20	83.6	10.7	80.6	10.9
22	94.5	10.9	91.4	10.8
24	105.5	11.0	102.5	11.1
26	116.6	11.1	113.4	10.9
28	127.7	11.1*	124.5	11.1
30	.....	.....	135.6	11.1*
		2)11.1		11.1
		5.55		5.55
		5.55		
		2)11.10		
		5.55 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

FRIDAY, November 13, 1795.

Parallelopipedon b, lengthened by having an inclined plane added to each extremity, called p.

Thermometer in the Air, 52½°;—In the Dock, 47½°.
—Wind, West, Moderate.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. W. 33 lbs. 8 oz.	
Accelerating Wt. 88 lbs.			Accel. Wt. 96 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.2	4.2	4.4	4.4
4	7.7	3.5	11.9	7.5
6	14.2	6.5	22.2	10.3
8	23.4	9.2	35.1	12.9
10	35.1	11.7	49.4	14.3
12	48.7	13.6	64.7	15.3
14	63.6	14.9	80.2	15.5
16	79.0	15.4	95.7	15.5
18	94.4	15.4	111.3	15.6*
20	110.0	15.6	126.8	15.5
22	125.6	15.6*	.....	.....
		2)15.6		2)31.1
		7.800		15.55
		7.775		7.775
		2)15.5750		
		7.7875 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

System Three-fold.

Total Wt. 207 lbs.		Motive Wt. 67 lbs.		
Accel. Wt. 263 lbs.			Accel. Wt. 291 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.8	8.8	10.0	10.0
4	24.4	15.6	27.0	17.0
6	44.0	19.6	47.1	20.1
8	65.1	21.1	68.2	21.1
10	86.2	21.1	89.2	21.0
12	107.4	21.2*	110.6	21.4*
14	128.9	21.5	132.0	21.4
		2)42.7		42.8
		2)21.35		21.4
		10.675		10.7
		10.700		
		2)21.3750		
		10.6875 Velocity with a Motive Wt. of 67 lbs.		

Parallelopipedon a, lengthened by having an inclined plane added to each extremity, called q.

Angle of incidence 9° 35′ 40″.

	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	
Velocity per Experiment.....	.....	.....	2.3425	3.2562	4.6240	6.4250	9.2250	.....	.....	
Hutt. Correction, or Regular Series	.....	1.6689	2.3494	3.3072	4.6554	6.5532	9.2250	11.2680	12.986	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.74127	3.0214	6.8732	12.315	19.360	28.016	38.290	50.193	63.729	78.903	95.718	114.18	145.56
Resistance of Parallel. p.	0.49275	2.0735	4.8073	8.730	13.866	20.239	27.862	36.752	46.919	58.376	71.133	85.20	109.23
Friction on 77.16 feet...	0.24852	0.9479	2.0659	3.585	5.494	7.777	10.428	13.441	16.810	20.527	24.585	28.98	36.33
Friction reduced to 50 feet	0.16104	0.61425	1.3387	2.3231	3.5602	5.0395	6.7574	8.7098	10.893	13.301	15.931	18.779	23.54
Friction on 77.16 ft. fig. i.	0.2600	1.0579	2.3702	4.165	6.412	9.085	12.153	15.592	19.375	23.47	27.87	32.56	40.17
Mean of Friction on 77.16	0.2542	1.0029	2.2180	3.875	5.953	8.431	11.290	14.516	18.092	22.00	26.22	30.77	38.25
Law of the Friction	.....	1.9802	1.9575	1.9394	1.9241	1.9088	1.8942	1.8822	1.8697	1.8563	1.8412	1.8391	1.8167

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.										
4 3 and	8 6	2.1047									
	16 12	2.0386	8 6..16 12	1.9764							
	33 8	2.0610	33 8	2.0398	16 12..33 8	2.1073					
	67 0	2.0227	67 0	1.9969	67 0	2.0072	33 8..67 0	1.9163			

10)20.2709

Mean 4 lbs. 3 oz. and 67 lbs... 2.0271

SATURDAY, November 21, 1795.

Parallelopipedon a, lengthened by having an inclined plane added to each extremity, called q.

Thermometer in the Air, 36°;—In the Dock, 42½°.—Calm.

System Three-fold.

Total Wt. 13 lbs. M. Wt. 4 lbs. 3 oz.				
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.1	2.1	1.7	1.7
8	5.6	3.5	4.5	2.8
12	9.5	3.9	8.2	3.7
16	14.9	5.4	12.9	4.7
20	21.0	6.1	18.4	5.5
24	27.8	6.8	24.7	6.3
28	35.4	7.6	31.7	7.0
32	43.5	8.1	39.5	7.8
36	52.5	9.0	47.9	8.4
40	61.4	8.9	56.2	8.3
44	70.7	9.3	65.2	9.0
48	80.1	9.4	74.2	9.0
52	89.5	9.4	83.3	9.1
54	94.3	4.8	87.7	4.4
56	99.0	4.7	92.4	4.7
58	103.7	4.7	96.9	4.5
60	108.5	4.8	101.6	4.7
62	113.3	4.8*	106.1	4.5
64	118.0	4.7	110.7	4.6*
66	.....	.....	115.3	4.6
68	.....	.....	119.9	4.6
70	.....	.....	124.6	4.7
72	.....	.....	129.2	4.6
		2)9.5		5)23.1
		2)4.75		4.62
		2.375		2.31
		2.310		
		2)4.685		
		2.3425	Velocity with a Motive Weight of 4 lbs. 3 oz.	

SATURDAY, November 21, 1795.

Parallelopipedon a, lengthened by having an inclined plane added to each extremity, called q.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 28 lbs.			A. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.3	4.3	3.7	3.7
8	10.4	6.1	9.4	5.7
12	18.5	8.1	16.8	7.4
16	28.0	9.5	25.8	9.0
20	39.0	11.0	36.4	10.6
24	50.6	11.6	47.6	11.2
28	63.1	12.5	60.1	12.5
32	75.7	12.6	72.6	12.5
36	88.4	12.7	85.2	12.6
40	101.4	13.0	98.1	12.9
42	107.9	6.5*	104.6	6.5*
44	114.4	6.5	111.1	6.5
46	120.9	6.5	117.6	6.5
48	127.5	6.6	124.1	6.5
		4)26.1		26.0
		2)6.525		6.5
		3.2625		3.25
		3.2500		
		2)6.5125		
		3.2562 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

System Three-fold.

T. Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.				
Accelerating Wt. 56 lbs.			A. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.6	1.6	1.8	1.8
4	4.3	2.7	4.6	2.8
6	7.9	3.6	8.2	3.6
8	12.5	4.6	13.9	4.8
10	18.0	5.5	18.5	5.5
12	24.3	6.3	24.8	6.3
14	31.3	7.0	31.9	7.1
16	39.1	7.8	39.8	7.9
18	47.6	8.5	48.2	8.4
20	55.6	8.0	56.2	8.0
22	64.6	9.0	65.1	8.9
24	73.5	8.9	74.2	9.1
26	82.5	9.0	83.1	8.9
28	91.6	9.1	92.2	9.1
30	100.8	9.2	101.4	9.2
32	110.1	9.3*	110.5	9.1*
34	119.3	9.2	119.7	9.2
36	128.6	9.3	129.1	9.4
		3)27.8		27.7
		2)9.266		9.233
		4.633		4.616
		4.616		
		2)9.249		
		4.624 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

SATURDAY, November 21, 1795.

Parallelopipedon a, lengthened by having an inclined plane added to each extremity, called q.

System Three-fold.

T. Wt. 103 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accel. Wt. 112 lbs.			A. W. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.2	3.2	2.7	2.7
4	8.3	5.1	7.1	4.4
6	15.1	6.8	13.4	6.3
8	23.5	8.4	21.3	7.9
10	33.3	9.8	30.6	9.3
12	44.2	10.9	41.3	10.7
14	56.0	11.8	53.0	11.7
16	68.2	12.2	65.3	12.3
18	80.7	12.5	77.9	12.6
20	93.2	12.5	90.7	12.8
22	106.0	12.8*	103.4	12.7*
24	118.8	12.8	116.3	12.9
26	131.8	13.0	129.2	12.9
		3)38.6		38.5
		2)12.866		12.833
		6.433		6.416
		6.417		
		2)12.850		
		6.425 Velocity with a Motive Weight of 33 lbs. 8 oz. †		

System Three-fold.

Total Wt. 207 lbs.			Motive Wt. 67 lbs.	
Accel. Wt. 250 lbs.			A. W. 250 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.4	4.4	4.7	4.7
4	12.9	8.5	13.5	8.8
6	25.1	12.2	25.9	12.4
8	40.5	15.4	41.6	15.7
10	57.4	16.9	58.6	17.0
12	75.4	18.0	76.5	17.9
14	93.5	18.1	94.7	18.2
16	111.9	18.4	113.2	18.5
18	130.3	18.4*	131.7	18.5*
		2)18.4		18.5
		9.20		9.25
		9.25		
		2)18.45		
		9.225 Velocity with a M. Wt. of 67 lbs.		

† The line used in making these experiments being larger than the former one, it became necessary to increase the Total Weight one pound to have the same Motive Weight.

Isosceles Triangle r, drawn through the water by its base.

Length 30 feet 4 inches. Depth 1 foot 2½ inches. Breadth 3 feet 4.5 inches. Area of the base 4.1141 feet.
Oblique side 30.380 feet. Angle of inclidence 3° 11′ 6″.

	Motive Weights.															
	lbs. oz. drs. 1 0 12		lbs. oz. drs. 2 1 8		lbs. oz. 4 3		lbs. oz. 8 6		lbs. oz. 16 12		lbs. oz. 33 8		lbs. oz. 67 0		lbs. oz. 100 8		lbs. oz. 134 0	
Velocity per Experiment	.....		0.7875		1.0374		.....		2.1583		2.9611		.....		.....		.....	
Hutt. Correction, or Regular Series	.....		0.80214		1.1118		1.5412		2.1362		2.9611		.....		.....		.....	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	3.3435	14.564	34.441	63.433	101.87	150.01	.....	.....	.....	.....	.....	.....	.....
Motive Weights, Vertex foremost	1.5992	6.2912	14.017	24.747	38.461	55.14	.....	.....	.....	.....	.....	.....	.....
Difference of Resistance. .	1.7443	8.2728	20.424	38.686	63.409	94.87	.....	.....	.....	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz. drs.		lbs. oz.							
2 1 8	and	4 3	2.5151						
		16 12	2.0625	4 3 .. 16 12	1.8923				
		33 8	2.0934	33 8	1.9826	16 12 .. 33 8	2.1918		
							6)12.7377		
						Mean 2 lbs. 1 oz. 8 drs. and 33 lbs. 8 oz. . .	2.1229		

FRIDAY, June 26, 1795.

Isosceles Triangle r, drawn through the water by its base.

Thermometer in the Air, 64°.—Wind, W.S.W.
Pleasant Breeze.

System Two-fold.

Total Wt. 4 lbs. 5 oz. M. Wt. 2 lbs. 1 oz. 8drs.

Accelerating Wt. 3 lbs.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
8	1.7	1.7	1.3	1.3
16	4.9	3.2	3.7	2.4
24	9.4	4.5	6.8	3.1
32	15.1	5.7	10.7	3.9
40	21.2	6.1	15.1	4.4
48	27.7	6.5	19.7	4.6
56	34.2	6.5	24.9	5.2
64	40.7	6.5	30.3	5.4
72	47.2	6.5	35.9	5.6
80	53.7	6.5	41.8	5.9
88	60.1	6.4	47.7	5.9
96	66.4	6.3	53.8	6.1
104	72.9	6.5	60.0	6.2
112	79.2	6.3	66.2	6.2
120	85.5	6.3	72.5	6.3
128	91.8	6.3*	78.8	6.3
136	.....	.....	85.1	6.3
144	.....	.....	91.4	6.3*
		8)6.3		6.3
		0.7875		0.7875
		0.7875		
		2)1.5750		
		0.7875 Velocity with a M. Wt. of 2 lbs. 1 oz. 8 drs.		

System Two-fold.

Total Wt. 8 lbs. 8 oz. M. Wt. 4 lbs. 3 oz.

Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
8	3.4	3.4	3.9	3.9
16	9.0	5.6	10.0	6.1
24	16.3	7.3	17.5	7.5
32	24.7	8.4	25.7	8.2
40	33.1	8.4	34.2	8.5
48	41.7	8.6	42.7	8.5
56	50.3	8.6	51.1	8.4
64	58.8	8.5	59.4	8.3
72	67.2	8.4	67.6	8.2
76	71.4	4.2	71.7	4.1
80	75.5	4.1	75.8	4.1*
82	79.7	4.2*	80.0	4.2
86	83.9	4.2	84.1	4.1
90	88.0	4.1	88.2	4.1
92	92.2	4.2	.....	.....
		4)16.7		16.5
		4)4.175		4.1250
		1.0437		1.0312
		1.0312		
		2)2.0749		
		1.0374 Velocity with a Motive Wt. of 4 lbs. 3 oz.		

WEDNESDAY, June 24, 1795.

Isosceles Triangle r, drawn through the water by its base.

Thermometer in the Air, 62½°;—In the Dock, 60½°.—Depth of Water 10½ feet.—Wind, S. W. Strong Breeze.

System Two-fold.

Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.		Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.3	3.3	3.8	3.8	3.1	3.1
8	8.2	4.9	9.3	5.5	8.0	4.9
12	14.4	6.2	15.9	6.6	14.3	6.3
16	21.3	6.9	23.1	7.2	21.4	7.1
20	28.9	7.6	31.0	7.9	29.2	7.8
24	37.0	8.1	39.2	8.2	37.3	8.1
28	45.2	8.2	47.6	8.4	45.7	8.4
30	49.5	4.3	51.9	4.3	49.9	4.2
32	53.7	4.2	56.1	4.2	54.1	4.2
34	58.0	4.3	60.3	4.2	58.4	4.3
36	62.3	4.3*	64.6	4.3*	62.6	4.2
38	66.5	4.2	68.9	4.3	66.9	4.3*
40	70.9	4.4	73.3	4.4	71.3	4.4
42	75.2	4.3	77.6	4.3	75.5	4.2
44	.....	.....	.....	.....	79.9	4.4
		4)17.2		17.3		17.3
		2)4.3		4.325		4.325
		2.1500		2.1625		2.1625
		2.1625				
		2.1625				
		3)6.4750				
		2.1583 Velocity with a Motive Weight of 16 lbs. 12 oz.				

WEDNESDAY, July 1, 1795.

Isosceles Triangle r, drawn through the water by its base.

Thermometer in the Air, 62½°;—In the Dock, 61½°.—Wind, S. W. and Showery.

System Two-fold.

Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. 10 lbs.			A. Wt. 10 lbs.		Accel. Wt. 10 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.9	1.9	1.9	1.9	2.6	2.6
4	4.9	3.0	4.6	2.7	6.0	3.4
6	8.6	3.7	8.3	3.7	10.2	4.2
8	12.9	4.3	12.5	4.2	14.9	4.7
10	17.6	4.7	17.4	4.9	19.9	5.0
12	22.7	5.1	22.4	5.0	25.1	5.2
14	28.0	5.3	27.7	5.3	30.6	5.5
16	33.5	5.5	33.2	5.5	36.1	5.5
18	39.1	5.6	38.9	5.7	41.8	5.7
20	44.7	5.6	44.6	5.7	47.5	5.7
22	50.4	5.7	50.4	5.8	53.3	5.8
24	56.2	5.8	56.1	5.7	59.1	5.8
26	61.9	5.7	62.0	5.9	64.9	5.8
28	67.8	5.9	67.9	5.9	70.9	6.0*
30	73.7	5.9	73.8	5.9	76.8	5.9
32	79.6	5.9	79.7	5.9	82.8	6.0
34	85.5	5.9*	85.6	5.9*	.....	.....
		2)5.9		5.9		3)17.9
		2.9500		2.95		5.9667
		2.9500				2.9833
		2.9833				
		3)8.8833				
		2.9611 Velocity with a Motive Wt. of 33 lbs. 8 oz.				

Isosceles Triangle r, drawn through the water by its vertex, called s.

Length of the oblique side 30.381 feet.* Angle of incidence 3° 11′ 6″.

	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0			
Velocity per Experiment	.....	1.1375	.....	2.1625	.....	4.6625	.....	.....	.....			
Hutt. Correction, or Regular Series	.....	1.1461	1.6277	2.3116	3.2830	4.6625	6.6217	.....	.....			

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.5992	6.2912	14.017	24.747	38.461	55.140	.....	.....	.....	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.	drs.		lbs.	oz.				
2	1	8	and	8	6	2.1580	8 6 .. 33 8	1.8044
				33	8	1.9654		
								3)5.9278
							Mean 2 lbs. 1 oz. 8 drs. and 33 lbs. 8 oz. ..	1.9759

* Query 30.380 feet?

FRIDAY, June 26, 1795.

Isosceles Triangle r, drawn through the water by its vertex, called s.

Thermometer in the Air, 64°.—Wind, W. S. W. Pleasant Breeze.

System Two-fold.

T. Wt. 4 lbs. 5 oz. M. Wt. 2 lbs. 1 oz. 8 drs.				
Accelerating Wt. 2 lbs.			A. Wt. 3 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
8	2.1	2.1	2.3	2.3
16	5.5	3.4	6.0	3.7
24	10.0	4.5	11.0	5.0
32	15.5	5.5	17.2	6.2
40	21.9	6.4	24.1	6.9
48	29.0	7.1	31.8	7.7
56	36.7	7.7	39.9	8.1
64	44.7	8.0	48.0	8.1
72	52.9	8.2	56.5	8.5
76	57.2	4.3	60.8	4.3
80	61.4	4.2	65.1	4.3
84	65.8	4.4	69.5	4.4
88	70.2	4.4	74.0	4.5
92	74.6	4.4	78.4	4.4
96	79.1	4.5	82.9	4.5*
100	83.7	4.6*	87.5	4.6
104	88.2	4.5	92.0	4.5
108	92.8	4.6	.....	.....
		3)13.7		13.6
		4)4.566		4.533
		1.1416		1.1334
		1.1334		
		2)2.2750		
Velocity with a Motive Wt. of 2 lbs. 1 oz. 8 drs.		1.1375		

WEDNESDAY, June 24, 1795.

Isosceles Triangle r, drawn through the water by its vertex, called s.

Thermometer in the Air, 62½°;—In the Dock, 60°.—Depth of Water, 10½ feet.—Wind, S. W.

System Two-fold.

Motive Weight 8 lbs. 6 oz.				
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.1	2.1	2.3	2.3
8	5.1	3.0	5.6	3.3
12	9.2	4.1	9.9	4.3
16	14.1	4.9	15.2	5.3
20	19.8	5.7	21.0	5.8
24	26.1	6.3	27.5	6.5
28	33.0	6.9	34.5	7.0
32	40.3	7.3	41.9	7.4
36	48.0	7.7	49.7	7.8
40	56.0	8.0	57.9	8.2
42	60.0	4.0	62.1	4.2
44	64.2	4.2	66.3	4.2
46	68.5	4.3	70.7	4.4*
48	72.8	4.3*	75.0	4.3
50	77.1	4.3	.....	.....
		2)8.6		8.7
		2)4.3		4.35
		2.150		2.175
		2.175		
		2)4.3250		
		2.1625 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

WEDNESDAY, July 1, 1795.

Thermometer in the Air, 62½°;—In the Dock, 61½°.—Wind, S. W. Showery.

System Two-fold.

Motive Weight 33 lbs. 8 oz.				
Accelerating Wt. 40 lbs.			Accel. Wt. 40 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.4	3.4	2.0	2.0
4	8.0	4.6	5.5	3.5
6	14.7	6.7	10.2	4.7
8	20.5	5.8	16.0	5.8
10	28.1	7.6	22.8	6.8
12	36.3	8.2	30.5	7.7
14	45.1	8.8	38.9	8.4
16	53.9	8.8	47.6	8.7
18	63.2	9.3	56.7	9.1
20	72.5	9.3*	65.8	9.1
22	81.7	9.2	75.2	9.4*
24	.....	.....	84.6	9.4
		2)18.5		18.8
		2)9.25		9.4
		4.625		4.7
		4.700		
		2)9.3250		
		4.6625 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

Isosceles Triangle t, drawn through the water by its base.

Length 20.222 feet. Breadth 3 feet 4.5 inches. Depth 1 foot 2.625 inches. Area of the base 4.1141 feet.
Oblique side 20.292 feet. Angle of incidence, 4° 46′ 18″.

	Motive Weights.											
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment	.....	.....	.....	1.5208	2.3180	3.0437	4.1562	.....	5.7291
Hutt. Correction, or Regular Series	.....	0.6633	1.1511	1.5867	2.1872	3.0151	4.1561	5.0146	5.7291

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	3.0905	13.807	33.139	61.684	99.873	148.06	.....	.....	.....	.....	.....	.....	.....
Motive Weights, Vertex foremost	0.9632	4.4353	10.837	20.426	33.396	49.905	70.088	94.062	121.93	.....	.....	.....	.....
Difference of Resistance	2.1273	9.3717	22.302	41.258	66.477	98.155	.....	.....	.....	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.															
8	6	and	16	12	1.6446														
			33	8	1.9980	16	12..	33	8	2.5449									
			67	0	2.0684			67	0	2.3742	33	8..	67	0	2.2251				
			134	0	2.0905			134	0	2.2981			134	0	2.1919	67..	134	0	2.1596

10)21.5953

Mean 67 lbs. and 134 lbs... 2.1595

TUESDAY, September 1, 1795.

Isosceles Triangle t, drawn through the water by its base.

Thermometer in the Air, 67°;—In the Dock 68°.—Wind, E. Light Breeze.

System Two-fold.

T. Wt. 16 lbs. 14 oz.			M. Wt. 8 lbs. 6 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.6	4.6	3.6	3.6
8	8.9	4.3	8.0	4.4
12	13.8	4.9	13.0	5.0
16	19.2	5.4	18.4	5.4
20	24.9	5.7	23.9	5.5
24	30.6	5.7	29.6	5.7
28	36.4	5.8	35.3	5.7
32	42.4	6.0	41.2	5.9
36	48.3	5.9	47.1	5.9
40	54.3	6.0	53.1†	5.9
44	60.3	6.0	59.1	6.1
48	66.4	6.1*	65.2	6.1*
52	72.5	6.1	71.3	6.1
56	78.5	6.0	77.4	6.1
	3)18.2			18.3
	4)6.066			6.1
	1.5166			1.525
	1.5250			
	2)3.0416			
	1.5208 Velocity with a Motive Weight of 8 lbs. 6 oz.			

† Query 53.0?

SATURDAY, August 29, 1795.

Isosceles Triangle t, drawn through the water by its base.

Thermometer in the Air, 62½°;—In the Dock, 68°.—Calm.

System Two-fold.

Total Weight 34 lbs. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 8 lbs.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.2	2.2	2.0	2.0	2.0	2.0
4	5.0	2.8	4.5	2.5	4.5	2.5
6	8.3	3.3	7.4	2.9	7.4	2.9
8	12.0	3.7	10.7	3.3	10.7	3.3
10	16.1	4.1	14.2	3.5	14.1	3.4
12	20.3	4.2	18.0	3.8	17.9	3.8
14	24.4	4.1	22.0	4.0	21.6	3.7
16	29.0	4.6	26.1	4.1	25.5	3.9
18	33.3	4.3	30.3	4.2	29.6	4.1
20	37.7	4.4	34.6	4.3	33.9	4.3
22	42.3	4.6	38.9	4.3	38.0	4.1
24	46.7	4.4	43.2	4.3	42.3	4.3
26	51.3	4.6	47.7	4.5	46.5	4.2
28	56.0	4.7	52.2	4.5	50.9	4.4
30	60.5	4.5	56.7	4.5	55.3	4.4
32	65.2	4.7	61.1	4.4	59.7	4.4
34	70.1	4.9	65.5	4.4	64.1	4.4
36	74.8	4.7*	70.1	4.6	68.7	4.6
38	79.6	4.8	74.7	4.6*	73.3	4.6*
40	84.3	4.7	79.1	4.4	78.0	4.7
42	.....	.....	83.6	4.5	82.6	4.6
44	.....	.....	88.2	4.6	87.3	4.7
		3)14.2		4)18.1		18.6
		2)4.733		4.525		4.65
		2.3666		2.2625		2.325
		2.2625				
		2.3250				
		3)6.9541				
		2.3180 Velocity with a Motive Weight of 16 lbs. 12 oz.				

SATURDAY, August 29, 1795.

Isosceles Triangle t, drawn through the water by its base.

System Two-fold.

T. Wt. 67 lbs. 10 oz.		M. Wt. 33 lbs. 8 oz.		
Accelerating Weight.			Accel. Weight.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.4	4.4	4.4	1.4
4	9.7	5.3	9.4	5.0
6	15.2	5.5	14.8	5.4
8	20.9	5.7	20.3	5.5
10	26.8	5.9	26.0	5.7
12	32.8	6.0	31.8	5.8
14	38.8	6.0	38.1	6.3
16	44.9	6.1	44.2	6.1
18	50.9	6.0	50.3	6.1
20	57.1	6.2*	56.3	6.0*
22	63.1	6.0	62.4	6.1
24	69.2	6.1	68.4	6.0
26	75.2	6.0	74.6	6.2
28	.....	.....	80.8	6.2
	4)24.3		5)30.5	
	2)6.075		6.1	
	3.0375		3.05	
	3.0500			
	2)6.0875			
	3.0437	Velocity with a Motive Wt. of 33 lbs. 8 oz.		

SATURDAY, August 22, 1795.

Thermometer in the Air, 63½°;—In the Dock, 68°.—Wind, W. S. W. Fresh Breeze.

System Ten-fold.

Total Wt. 765 lbs.		Motive Wt. 67 lbs.		
Accelerating Weight.			Accel. Weight.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.9	7.9	5.7	5.7
4	15.4	7.5	12.4	6.7
6	23.2	7.8	19.8	7.4
8	39.1	5.9	27.4	7.6
10	47.1	8.0	35.4	8.0
12	55.2	8.1	43.4	8.0
14	63.2	8.0	51.5	8.1
16	71.4	8.2	59.6	8.1
18	79.5	8.1	67.7	8.1
20	87.7	8.2	75.8	8.1
22	95.8	8.1	84.0	8.2
24	104.0	8.2	91.9	7.9
26	112.2	8.2	100.1	8.2
28	120.4	8.2	108.3	8.2
30	128.5	8.1	116.5	8.2
32	136.8	8.3	124.7	8.2
34	145.1	8.3	133.0	8.3
36	153.5	8.4*	141.2	8.2
38	161.8	8.3	149.7	8.5
40	170.1	8.3	157.9	8.2*
42	178.3	8.2	166.2	8.3
44	.....	.....	174.6	8.4
46	.....	.....	183.0	8.4
	4)33.2		33.3	
	2)8.3		8.3250	
	4.1500		4.1625	
	4.1625			
	2)8.3125			
	4.1562	Velocity with a Motive Wt. of 67 lbs.		

FRIDAY, August 28, 1795.

Isosceles Triangle t, drawn through the water by its base.

Thermometer in the Air, 62°;—In the Dock, 68°.—Wind, N.W. Moderate.

System Ten-fold.

Total Weight 1486 lbs. Motive Weight 134 lbs.						
Accelerating Weight.			Accelerating Wt.		Accelerating Wt.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	9.1	9.1	9.1	9.1	9.7	9.7
4	19.5	10.4	19.9	10.8	20.5	10.8
6	30.2	10.7	31.0	11.1	31.4	10.9
8	41.5	11.3	42.1	11.1	42.4	11.0
10	52.6	11.1	53.5	11.4	53.6	11.2
12	64.0	11.4	64.7	11.2	64.6	11.0
14	75.3	11.3	76.2	11.5	76.0	11.4
16	86.9	11.6*	87.7	11.5*	87.5	11.5
18	98.2	11.3	99.3	11.6	98.9	11.4
20	109.5	11.3	110.9	11.6	110.3	11.4*
22	120.9	11.4	122.5	11.6	121.6	11.3
24	.....	.....	.....	.....	133.0	11.4
26	.....	.....	.....	.....	144.5	11.5
		4)45.6		46.3		45.6
		2)11.4		11.575		11.4
		5.7000		5.7875		5.7
		5.7875				
		5.7000				
		3)17.1875				
		5.7291	Velocity with a M. Wt. of 134 lbs.			

Isosceles Triangle t, drawn through the water by its vertex, called u.

Length of the oblique side 20.292 feet. Angle of incidence 4° 46′ 12″.*

	Motive Weights.																	
	lbs.	oz.	drs.	lbs.	oz.	drs.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
	1	0	12	2	1	8	4	3	8	6	16	12	33	8	67	0	100	8	134	0
Velocity per Experiment.....	.....			.....			.....		2.5000		3.6444		5.1750		6.8583		.....		8.9625	
Hutt. Correction, or Regular Series.....				1.4224			1.9485		2.6688		3.6556		5.0071		6.8583		8.2441		9.3939	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.9632	4.4353	10.837	20.426	33.396	49.905	70.088	94.062	121.93	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.													
8	6	and	16	12	1.8390												
			33	8	1.9055	16	12..	33	8	1.9768							
			67	0	2.0605			67	0	2.1926	33	8..	67	0	2.4612		
			134	0	2.1715			134	0	2.3108			134	0	2.5241	67	0.. 134 0	2.5904

10) 22.0324

Mean 16 lbs. 12 oz. and 67 lbs.. . 2.2032

* In page 170 the same figure is given drawn through the water by its base, and the angle of incidence is called 4° 46′ 18″. Mr. JOHN CARY, having re-calculated the angle, finds that 4° 46′ 12″ is right. "It seems," he says, "that the error lies in the oblique side of the Triangle, it ought to be 20.276, and this has evidently arisen from not having the 4.5 inches of the breadth reduced to the decimal part of a foot: if the breadth was 3.45 feet it would be correct; but it ought to be 3.375, and this gives for the oblique side 20.276."—J. C. See p. 170 for dimensions.

175

TUESDAY, September, 1, 1795.

Isosceles Triangle t, drawn through the water by its vertex, called u.

Thermometer in the Air, 67°;—In the Dock, 68°.—Wind, E. Light Breeze.

System Two-fold.

	lbs. oz.		lbs. oz.
T. W.	16 12	M. W.	8 6

Accelerating Wt. 7 lbs.

Sec.	Feet.	Differences.
2	2.0	2.0
4	4.4	2.4
6	7.1	2.7
8	10.2	3.1
10	13.6	3.4
12	17.3	3.7
14	21.4	4.1
16	25.6	4.2
18	30.2	4.6
20	34.8	4.6
22	39.2	4.4
24	44.4	5.2
26	49.2	4.8
28	54.2	5.0
30	59.2	5.0
32	64.2	5.0
34	69.2	5.0
36	74.2	5.0
38	79.2	5.0*
40	84.1	4.9
42	89.2	5.1

3)15.0

2)5.0

2.5 Velocity with a Motive Wt. of 8 lbs. 6 oz.

SATURDAY, August 29, 1795.

Isosceles Triangle t, drawn through the water by its vertex, called u.

Thermometer in the Air, 62½°;—In the Dock, 68°.—Calm.

System Two-fold.

Total Weight 34 lbs. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.3	2.3	1.8	1.8	2.0	2.0
4	5.7	3.4	4.9	3.1	5.2	3.2
6	10.1	4.4	9.0	4.1	9.5	4.3
8	15.4	5.3	13.9	4.9	14.5	5.0
10	21.4	6.0	19.8	5.9	20.5	6.0
12	27.6	6.2	26.3	6.5	27.1	6.6
14	34.7	7.1	32.5	6.2	33.5	6.4
16	41.6	6.9	39.6	7.1	40.5	7.0
18	48.6	7.0	46.6	7.0	47.6	7.1
20	55.7	7.1	53.6	7.0	54.8	7.2
22	62.6	6.9	60.7	7.1	61.8	7.0
24	69.9	7.3	67.8	7.1	69.0	7.2
26	77.1	7.2*	75.1	7.3*	76.2	7.2*
28	84.4	7.3	82.4	7.3	83.6	7.4
30	91.7	7.3	89.7	7.3	90.9	7.3
		3)21.8		21.9		21.9
		2)7.2660		7.3		7.3
		3.6333		3.65		3.65
		3.6500				
		3.6500				
		3)10.9333				
		3.6444 Velocity with a Motive Weight of 16 lbs. 12 oz.				

FRIDAY, August 28, 1795.

Isosceles Triangle t, drawn through the water by its vertex, called u.

Thermometer in the Air, 62°;—In the Dock, 68°.—Wind, N. W. Moderate.

System Two-fold.

Total Wt. 67 lbs. 10 oz.			M. Wt. 33 lbs. 8 oz.	
Accel. Wt. 35 lbs.			Accel. Wt. 35 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.0	5.0	4.4	4.4
4	11.4	6.4	10.5	6.1
6	19.3	7.9	17.9	7.4
8	28.3	9.0	26.6	8.7
10	37.9	9.6	36.1	9.5
12	47.8	9.9	45.6	9.5
14	58.1	10.3	55.8	10.2
16	68.5	10.4	65.8	10.0
18	78.9	10.4*	76.0	10.2*
20	89.3	10.4	86.4	10.4
		2)20.8		20.6
		2)10.4		10.3
		5.20		5.15
		5.15		
		2)10.350		
		5.175 Velocity with a M. Wt. of 33 lbs. 8 oz.		

SATURDAY, August 22, 1795.

Thermometer in the Air, 63½°;—In the Dock, 68°.—Wind, W. S. W. Fresh Breeze.

System Ten-fold.

Total Wt. 765 lbs.			Motive Wt. 67 lbs.	
Accelerating Weight.			Accel. Weight.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.6	6.6	7.2	7.2
4	15.0	8.4	15.8	8.6
6	24.6	9.6	26.1	10.3
8	35.5	10.9	37.0	10.9
10	47.0	11.5	48.8	11.8
12	59.3	12.3	61.1	10.3
14	71.8	12.5	74.0	12.9
16	84.8	13.0	87.4	13.4
18	98.0	13.2	100.7	13.3
20	111.5	13.5	114.2	13.5
22	124.8	13.3	127.8	13.6
24	138.6	13.8*	141.5	13.7*
26	152.2	13.6	155.2	13.7
28	166.0	13.8	168.9	13.7
		3)41.2		41.1
		2)13.733		13.7
		6.8666		6.85
		6.8500		
		2)13.7166		
		6.8583 Velocity with a Motive Wt. of 67 lbs.		

FRIDAY, August 28, 1795.

Isosceles Triangle t, drawn through the water by its vertex, called u.

System Ten-fold.

Total Wt. 1486 lbs.			Motive Wt. 134 lbs.	
Accelerating Weight.			Accel. Wt. 134 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	11.6	11.6	12.6	12.6
4	26.0	14.4	27.8	15.2
6	42.4	16.4	44.7	16.9
8	59.6	17.2	62.2	17.5
10	77.1	17.5	80.1	17.9
12	95.0	17.9	97.9	17.8
14	112.8	17.8	115.9	18.0*
16	130.7	17.9*	133.8	17.9
18	148.6	17.9	.....	.....
		2)35.8		35.9
		2)17.9		17.95
		8.950		8.975
		8.975		
		2)17.925		
		8.9625 Velocity with a Motive Weight of 134 lbs.		

Isosceles Triangle v, drawn through the water by its base.

Length 10.111 feet. Breadth 3.375 feet. Depth 1 foot 2.625 inches. Area of the base 4.1141 feet. Oblique side 10.251 feet. Angle of incidence 9° 29′ 30″.

	Motive Weights.												
	lbs. oz. drs. 1 0 12	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0
Velocity per Experiment	.....	.....	.....	1.5562	2.1750	3.0000	.....	5.000	.....
Hutt. Correction, or Regular Series		0.81111	1.1233	1.5557	2.1546	2.9841	4.1327	5.000	5.7237

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	3.2695	14.295	33.883	66.502	100.50	148.15	.....	.....	.....	.....	.....	.....	.....
Motive Weights, Vertex foremost	.....	3.5698	9.444	18.836	32.176	49.836	72.145	99.399	.....	.....	.....	.....	.....
Difference of Resistance..	.....	10.7252	24.439	47.666	68.324	98.314	.....	.....	.....	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.									
8	6	and	16	12	2.0705	16	12	33	8	2.1555	33	8	2.1506
			33	8	2.1121			100	8	2.1525			
			100	8	2.1290								

6) 12.7702

Mean 8 lbs. 6 oz. and 100 lbs. 8 oz. .. 2.1284

WEDNESDAY, November 25, 1795.

Isosceles Triangle v, drawn through the water by its base.

Thermometer in the Air, 43½°;—In the Dock, 43°.—Calm.

System Three-fold.

T. W. lbs. 26	M. W. lbs. oz. 8 6
Accelerating Wt. 7 lbs.	

Sec.	Feet.	Differences.
4	6.4	6.4
8	13.0	6.6
12	19.8	6.8
16	26.6	6.8
20	33.4	6.8
24	39.9	6.5
28	46.4	6.5
32	52.6	6.2
36	58.8	6.2
40	64.9	6.1
44	70.9	6.0
48	77.0	6.1
52	83.4	6.4*
56	89.6	6.2
60	95.8	6.2
64	101.9	6.1

4)24.9

4)6.2250

1.5562 Velocity with a Motive Wt. of 8 lbs. 6 oz.

System Three-fold.

T. W. lbs. oz. 51 8	M. W. lbs. oz. 16 12
Accelerating Wt. none.	

Sec.	Feet.	Differences.
4	3.0	3.0
8	9.0	6.0
12	16.4	7.4
16	24.3	7.9
20	32.5	8.2
24	40.7	8.2
28	48.9	8.2
32	57.2	8.3
36	65.5	8.3
40	73.8	8.3
44	82.2	8.4
48	90.7	8.5
52	99.2	8.5
56	107.7	8.5
60	116.3	8.6
64	125.0	8.7
68	133.7	8.7*

4)8.7

2.175 Velocity with a M. W. of 16 lbs. 12 oz.

WEDNESDAY, November 25, 1795. MONDAY, November 23, 1795.

Isosceles Triangle v, drawn through the water by its base.

Thermometer in the Air, 44½°;—In the Water, 43°.
—Calm.

System Three-fold.

T. W. lbs. oz. 102 8	M. W. lbs. oz. 33 8	
Accelerating Wt. none.		
Sec.	Feet.	Differences.
4	8.6	8.6
8	19.7	11.1
12	31.4	11.7
16	43.4	12.0
20	55.7	12.3
24	68.1	12.4
28	80.3	12.2
32	92.4	12.1
34	98.5	6.1
36	104.5	6.0
38	110.6	6.1*
40	116.6	6.0
42	122.6	6.0
44	128.5	5.9
46	134.5	6.0

5)30.0

2)6.0

3.0 Velocity with a M. Wt. of 33 lbs. 8 oz.

System Three-fold.

T. W. lbs. oz. 307 8	M. W. lbs. oz. 100 8	
Accelerating Wt. none.		
Sec.	Feet.	Differences.
2	8.0	8.0
4	17.6	9.6
6	27.4	9.8
8	37.1	9.7
10	46.8	9.7
12	56.6	9.8
14	66.5	9.9
16	76.5	10.0
18	86.5	10.0
20	96.4	9.9
22	106.4	10.0
24	116.4	10.0
26	126.4	10.0*

2)10.0

5.0 Velocity with a Motive Wt. of 100 lbs. 8 oz.

Isosceles Triangle v, drawn through the water with its vertex foremost.

Length of the oblique side 10.251 feet. Angle of incidence 9° 29′ 30″.

	Motive Weights.																			
	lbs.	oz.	drs	lbs.	oz.	drs.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
	1	0	12	2	1	8	4	3	8	6	16	12	33	8	67	0	100	8	134	0
Velocity per Experiment.....	.....			.....			.....		2.6200		3.8312		5.2208		6.7875		7.7500		.....	
Hutt. Correction, or Regular Series.....				1.6013			2.1376		2.8534		3.8091		5.0847		6.7875		8.0369		9.0604	

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	.....	3.5698	9.4442	18.836	32.176	49.836	72.145	99.399	.....	.....	.....	.....	.....

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.																
8	6	and	16	12	1.8241															
			33	8	2.0107	16	12	..	33	8	2.2398									
			67	0	2.1845				67	0	2.4241	33	8	..	67	0	2.6411			
			100	8	2.2913				100	8	2.5432				100	8	2.7811	67	0 .. 100	8	3.0576

10) 23.9975

Mean 16 lbs. 12 oz. and 67 lbs. .. 2.3997

183

WEDNESDAY, November 25, 1795.

Isosceles Triangle v, drawn through the water by its vertex.

Thermometer in the Air, 43½°;—In the Dock, 43°.—Calm.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.

Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.4	3.4	3.1	3.1
8	8.7	5.3	8.2	5.1
12	15.7	7.0	14.9	6.7
16	23.9	8.2	22.9	8.0
20	33.1	9.2	31.9	9.0
24	43.0	9.9	41.8	9.9
28	53.5	10.5	52.2	10.4
32	63.9	10.4	62.6	10.4
36	74.4	10.5	70.1†	10.5
40	84.8	10.4	83.6	10.5
44	95.2	10.4	99.3	5.7
46	100.4	5.2	104.5	5.2
48	105.6	5.2	109.7	5.2
50	110.9	5.3*	115.0	5.3
52	116.2	5.3	120.2	5.2*
54	121.4	5.2	125.3	5.1
56	126.8	5.4	130.5	5.2
60	132.1	5.3	135.7	5.2
62	.....	.....	140.9	5.2
		5)26.5		25.9
		2)5.3		5.18
		2.65		2.59
		2.59		
		2)5.24		
		2.62 Velocity with a M. Wt. of 8 lbs. 6 oz.		

Sec.	Feet.		Feet.	Differences.
† 36	70.1	should be	73.1	10.5
40	83.6	———	83.6	10.5
44	99.3	———	94.3	10.7
48	104.5	———	104.5	10.2
50	109.7	———	109.7	5.2

System Three-fold.

T. Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.

Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	6.4	6.4	3.6	3.6
8	13.3	6.9	11.3	7.7
12	23.5	10.2	22.1	10.8
16	36.1	12.6	35.0	12.9
20	50.3	14.2	49.4	14.4
24	65.3	15.0	64.5	15.1
28	80.6	15.3	79.8	15.3
32	95.8	15.2	95.0	15.1‡
34	103.5	7.7	102.6	7.6
36	111.1	7.6	110.2	7.6*
38	118.8	7.7*	117.9	7.7
40	126.4	7.6	125.6	7.7
42	134.1	7.7	133.2	7.6
44	141.8	7.7	.....	.....
		4)30.7		30.6
		2)7.675		7.65
		3.8375		3.825
		3.8250		
		2)7.6625		
		3.8312 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

‡ Should be 15.2.

WEDNESDAY, November 25, 1795.

Isosceles Triangle v, drawn through the water by its vertex.

System Three-fold.

Total Weight 102 lbs. 8 oz.			Motive Weight 33 lbs. 8 oz.			
Accel. Wt. 14 lbs.			A. Wt. 14 lbs.		A. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.5	2.5	3.0	3.0	2.6	2.6
4	6.9	4.4	7.4	4.4	7.2	4.6
6	12.9	6.0	13.5	6.1	13.3	6.1
8	20.3	7.4	21.0	7.5	20.7	7.4
10	28.7	8.4	29.5	8.5	29.2	8.5
12	37.9	9.2	38.8	9.3	38.4	9.2
14	47.6	9.7	48.6	9.8	48.2	9.8
16	57.6	10.0	58.8	10.2	58.2	10.0
18	68.0	10.4	69.1	10.3	68.6	10.4
20	78.4	10.4	79.4	10.3	78.9	10.3
22	88.8	10.4	89.9	10.5	89.3	10.4
24	99.3	10.5*	100.4	10.5*	99.8	10.5*
26	109.7	10.4	110.9	10.5	110.3	10.5
28	120.1	10.4	121.3	10.4	120.7	10.4
30	130.5	10.4	131.7	10.4	131.1	10.4
		4)41.7		41.8		41.8
		2)10.425		10.45		10.45
		5.2125		5.225		5.225
		5.2250				
		5.2250				
		3)15.6625				
		5.2208 Velocity with a Motive Weight of 33 lbs. 8 oz.				

MONDAY, November 23, 1795.

Isosceles Triangle v, drawn through the water by its vertex.

Thermometer in the Air, 44½°;—In the Dock, 43°.—Calm.

System Three-fold.

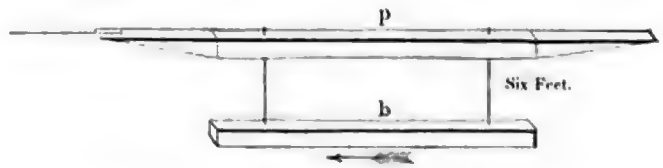
Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.6	6.6	7.8	7.8
4	16.4	9.8	18.3	10.5
6	28.4	12.0	30.9	12.6
8	41.8	13.4	44.3	13.4
10	55.0	13.2	57.6	13.3
12	68.1	13.1	70.9	13.3
14	81.1	13.0	84.2	13.3
16	94.4	13.3	97.6	13.4
18	108.0	13.6*	111.2	13.6*
20	121.5	13.5	124.8	13.6
		2)27.1		27.2
		2)13.55		13.6
		6.775		6.8
		6.800		
		2)13.575		
		6.7875 Velocity with a Motive Wt. of 67 lbs.		

System Three-fold.

T. Wt. 307 lbs. 8 oz. M. Wt. 100 lbs. 8 oz.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.2	7.2	7.3	7.3
4	18.9	11.7	19.2	11.9
6	33.6	14.7	33.8	14.6
8	49.2	15.6	49.6	15.8
10	64.7	15.5	65.2	15.6
12	80.2	15.5	80.7	15.5
14	95.6	15.4	96.3	15.6
16	111.1	15.5	111.8	15.5
18	126.6	15.5*	127.3	15.5*
		15.5		15.5
		7.75		7.75
		7.75		
		2)15.50		
		7.75 Velocity with a M. Wt. of 100 lbs. 8 oz.		

EXPERIMENTS MADE BELOW THE SURFACE OF THE WATER.

Parallelopipedon **p**, with parallelopipedon **b** attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.



	Motive Weights.							
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment.....	.....	.....	2.350	3.3375	4.575	5.700	6.6625	7.4625
Hutt. Correction, or Regular Series	1.1631	1.6913	2.3487	3.3375	4.7426	5.8248	6.7394	7.5465

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	3.1080	12.199	27.146	47.882	74.363	106.55	144.41	187.94	237.10	291.86	352.25	418.19	529.68
Conductor and Bars.....	1.6627	6.080	12.981	22.233	33.750	47.47	63.33	81.30	101.34	123.41	147.50	173.57	217.15
Resistance and Friction..	1.4453	6.119	14.165	25.649	40.613	59.08	81.08	106.64	135.76	168.45	204.75	244.62	312.53
Friction on 102.88 feet..	0.3832	1.470	3.225	5.625	8.671	12.34	16.62	21.51	26.99	33.08	39.74	47.00	56.71
Plus and Minus Pressure	1.0621	4.649	10.940	20.024	31.942	46.74	64.46	85.13	108.77	135.37	165.01	197.62	255.82
Ditto reduced to one foot	0.71479	3.129	7.362	13.476	21.497	31.53	43.38	57.29	73.20	91.10	111.05	133.00	172.17

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs.	oz.														
16 12 and	33	8	1.9759													
	67	0	2.0809	33 8..	67 0	2.1978										
	100	8	2.0222		100 8	2.0526	67..	100 8	1.8442							
	134	0	1.9955		134 0	2.0054		134 0	1.8440	100 8..	134 0	1.8438				
	167	8	1.9927		167 8	2.0001		167 8	1.8728		167 8	1.8960	134..	167 8	1.9679	

15)29.5918

Mean 16 lbs. 12 oz. and 33 lbs. 8 oz... 1.9727

TUESDAY, December 22, 1795.

Parallelopipedon p, with parallelopipedon b attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 55°;—In the Dock 47°.—Wind, S.W. Strong Breeze.

System Three-fold.

T. Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.				
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.5	2.5	2.6	2.6
8	6.8	4.3	6.9	4.3
12	12.7	5.9	12.6	5.7
16	19.9	7.2	19.7	7.1
20	28.0	8.1	27.7	8.0
24	36.8	8.8	36.5	8.8
28	45.8	9.0	45.4	8.9
32	54.9	9.1	54.5	9.1
36	64.1	9.2	63.8	9.3
40	73.3	9.2	73.1	9.3
44	82.5	9.2	82.4	9.3
48	91.8	9.3	91.7	9.3
52	101.3	9.5	101.0	9.3
54	105.9	4.6	105.7	4.7
56	110.5	4.6	110.4	4.7
58	115.1	4.6	115.0	4.6
60	119.8	4.7	119.7	4.7
62	124.5	4.7	124.4	4.7
64	129.2	4.7	129.0	4.6
66	133.9	4.7	133.7	4.7
68	138.6	4.7*	138.4	4.7*
		2)4.7		4.7
		2.35		2.35
		2.35		
		2)4.70		
		2.35 Velocity with a Motive Weight of 16 lbs. 12 oz.		

TUESDAY, December 22, 1795. MONDAY, December 21, 1795.

Parallelopipedon p, with parallelopipedon b attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 51½°;—In the Dock 46°.—Wind, S. W. Fresh Breeze.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.4	3.4	3.8	3.8
8	10.2	6.8	11.1	7.3
12	20.1	9.9	21.3	10.2
16	32.0	11.9	33.4	12.1
20	44.7	12.7	46.1	12.7
24	57.8	13.1	59.1	13.0
28	71.0	13.2	72.2	13.1
32	84.1	13.1	85.4	13.2
34	90.7	6.6	92.0	6.6
36	97.3	6.6	98.6	6.6
38	103.9	6.6	105.3	6.7
40	110.6	6.7	111.9	6.6
42	117.2	6.6	118.5	6.6
44	123.9	6.7*	125.2	6.7*
46	130.5	6.6	131.9	6.7
		2)13.3		13.4
		2)6.65		6.7
		3.325		3.35
		3.350		
		2)6.6750		
		3.3375 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

System Three-fold.

Total Wt. 207 lbs.			Motive Wt. 67 lbs.	
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.7	2.7	1.6	1.6
4	7.2	4.5	5.1	3.5
6	13.3	6.1	10.4	5.3
8	20.5	7.2	17.1	6.7
10	28.7	8.2	24.8	7.7
12	37.3	8.6	33.1	8.3
14	46.1	8.8	41.9	8.8
16	55.1	9.0	50.8	8.9
18	64.1	9.0	59.8	9.0
20	73.1	9.0	68.8	9.0
22	82.2	9.1	77.8	9.0
24	91.2	9.0	86.9	9.1
26	100.4	9.2	96.0	9.1
28	109.5	9.1	105.2	9.2
30	118.6	9.1*	114.3	9.1*
32	127.8	9.2	123.5	9.2
		2)18.3		18.3
		2)9.15		9.15
		4.575		4.575
		4.575		
		2)9.150		
		4.575 Velocity with a Motive Wt. of 67 lbs.		

MONDAY, December 21, 1795.

Parallelopipedon p, with parallelopipedon b attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

System Three-fold.

T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accel. Weight 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.6	3.6	2.8	2.8
4	10.0	6.4	8.6	5.8
6	18.4	8.4	16.7	8.1
8	28.3	9.9	26.3	9.6
10	38.9	10.6	36.7	10.4
12	49.7	10.8	47.6	10.9
14	60.8	11.1	58.6	11.0
16	72.0	11.2	69.7	11.1
18	83.2	11.2	80.9	11.2
20	94.5	11.3	92.2	11.3
22	105.9	11.4	103.6	11.4
24	117.3	11.4*	115.0	11.4
26	.....	.....	126.4	11.4*
		2)11.4		11.4
		5.7		5.7
		5.7		
		2)11.4		
		5.7 Velocity with a M. Wt. of 100 lbs. 8 oz.		

System Three-fold.

Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accel. Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.6	2.6	2.8	2.8
4	9.2	6.6	9.6	6.8
6	18.8	9.6	19.3	9.7
8	30.4	11.6	31.1	11.8
10	43.0	12.6	43.9	12.8
12	55.9	12.9	57.1	13.2
14	68.8	12.9	70.4	13.3
16	81.9	13.1	83.6	13.2
18	95.0	13.1	96.8	13.2
20	108.3	13.3*	110.2	13.4*
22	121.6	13.3	123.5	13.3
		2)26.6		26.7
		2)13.3		13.35
		6.650		6.675
		6.675		
		2)13.325		
		6.6625 Velocity with a M. Wt. of 134 lbs.		

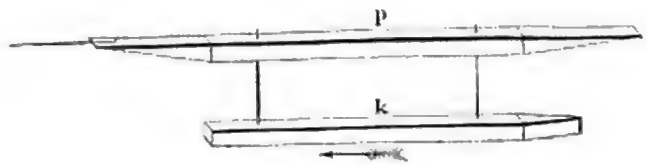
MONDAY, December 21, 1795.

Parallelopipedon p, with parallelopipedon b attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

System Three-fold.

Total Wt. 511 lbs. 4 oz. M. Wt. 167 lbs. 8 oz.				
Accelerating Wt. 112 lbs.			Accel. Wt. 126 lbs.	
Sec	Feet.	Differences.	Feet.	Differences.
2	6.0	6.0	2.6	2.6
4	16.0	10.0	10.2	7.6
6	28.6	12.6	21.3	11.1
8	42.7	14.1	34.7	13.4
10	57.2	14.5	49.1	14.4
12	71.9	14.7	63.9	14.8
14	86.6	14.7	78.7	14.8
16	101.5	14.9	93.6	14.9
18	116.4	14.9*	108.5	14.9*
20	.....	.....	123.5	15.0
		2)14.9		29.9
		7.450		14.95
		7.475		7.475
		2)14.925		
		7.4625 Velocity with a Motive Weight of 167 lbs. 8 oz.		

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet. Angle of incidence, 9° 35′ 40″.



	Motive Weights.							
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment			2.3886	3.3725	4.8208	5.9000	6.8875	7.7666
Hutt. Correction, or Regular Series	1.1548	1.6506	2.3595	3.3726	4.8208	5.9412	6.8908	7.7307

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	3.1671*	12.154	26.693	46.645	71.918	102.44	138.15	179.01	224.97	275.99	332.04	393.11	495.96
Conductor and bars	1.6627	6.080	12.981	22.233	33.750	47.47	63.33	81.30	101.34	123.41	147.50	173.57	217.15
Friction and Resistance	1.5034	6.074	13.712	24.412	38.168	54.97	74.82	97.71	123.63	152.58	184.54	219.54	278.81
Friction on 107.27 feet	0.3986	1.533	3.363	5.865	9.041	12.86	17.33	22.43	28.14	34.49	41.44	49.00	61.72
Plus and Minus Pressure	1.1048	4.541	10.349	18.547	29.127	42.11	57.49	75.28	95.49	118.09	143.10	170.54	217.09
Ditto reduced to one foot	0.7418	3.056	6.965	12.482	19.602	28.34	38.69	50.66	64.26	79.47	96.31	114.77	146.10

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.	lbs.	oz.															
16	12 and	33	8	2.0094														
		67	0	1.9741	33	8..	67	0	1.9402									
		100	8	1.9815			100	8	1.9643	67	0..	100	8	2.0071				
		134	0	1.9635			134	0	1.9414			134	0	1.9429	100	8..	134	0	1.8590			
		167	8	1.9528			167	8	1.9294			167	8	1.9214			167	8	1.8583	134..	167	8	1.8576

15) 29.1029

Mean 33 lbs. 8 oz. and 67 lbs.. 1.9402

* Should be 3.1661?

TUESDAY, December 29, 1795.

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 55¼°;—In the Dock, 46°.—Wind, W.S.W. Strong Breeze.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.8	2.8	4.1	4.1
8	7.6	4.8	11.0	6.9
12	13.9	6.3	19.0	8.0
16	21.5	7.6	27.7	8.7
20	29.8	8.3	37.0	9.3
24	38.8	9.0	46.6	9.6
28	48.3	9.5	56.3	9.7
32	57.9	9.6	66.0	9.7
36	67.6	9.7	75.6	9.6
40	77.2	9.6	85.0	9.4
44	86.6	9.4	94.4	9.4
48	96.0	9.4	103.9	9.5
50	100.8	4.8	108.7	4.8
52	105.5	4.7	113.6	4.9*
54	110.2	4.7	118.3	4.7
56	114.9	4.7	123.1	4.8
58	119.7	4.8*	127.9	4.8
60	124.4	4.7	132.6	4.7
62	129.2	4.8	.....	.....
64	133.9	4.7	.....	.....
66	138.6	4.7	.....	.....
		5)23.7		23.9
		2)4.74		4.78
		2.37		2.39
		2.39		
		2)4.76		
		2.38		

SATURDAY, January 16, 1796.

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer broke.—Wind, W.S.W. Moderate.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.6	4.6	4.1	4.1	3.4	3.4
8	11.0	6.4	9.9	5.8	8.4	5.0
12	18.7	7.7	17.1	7.2	14.5	6.1
16	27.2	8.5	25.2	8.1	21.4	6.9
20	36.2	9.0	34.2	9.0	29.0	7.6
24	45.5	9.3	43.3	9.1	37.1	8.1
28	54.7	9.2	52.6	9.3	45.5	8.4
32	64.1	9.4	61.9	9.3	54.2	8.7
36	73.4	9.3	71.3	9.4	63.1	8.9
40	82.8	9.4	80.6	9.3	72.1	9.0
44	92.2	9.4	90.1	9.5	81.2	9.1
48	101.7	9.5	99.6	9.4†	90.5	9.3
52	111.1	9.4	109.1	9.5	99.9	9.4
54	115.8	4.7	113.8	4.7	109.3	9.4
56	120.7	4.9*	118.6	4.8	118.8	9.5
58	125.4	4.7	123.4	4.8	123.6	4.8
60	130.2	4.8	128.1	4.7*	128.3	4.7
			132.9	4.8	133.1	4.8
		3)14.4	137.7	4.8	137.9	4.8
			.....	.....	142.7	4.8*
		2)4.8				
				3)14.3		2)4.8
		2.4000				
		2.3833		4.766		2.4
		2.4000				
		2.3700		2.3833		
		2.3900				
		5)11.9433				
		2.3886 Velocity with a Motive Weight of 16 lbs. 12 oz.				

† Query 9.5?

TUESDAY, December 29, 1795.

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 55½°;—In the Dock 46°.—Wind, W. S. W. Strong Breeze.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.8	4.8	4.9	4.9
8	13.0	8.2	13.2	8.3
12	23.8	10.8	24.1	10.9
16	36.2	12.4	36.4	12.3
20	49.2	13.0	49.3	12.9
24	62.4	13.2	62.3	13.0
28	75.7	13.3	75.4	13.1
32	89.0	13.3	88.5	13.1
34	95.7	6.7	95.2	6.7
36	102.4	6.7	101.8	6.6
38	109.1	6.7	108.4	6.6
40	115.8	6.7	115.2	6.8*
42	122.5	6.7	121.8	6.6
44	129.2	6.7	128.5	6.7
46	135.9	6.7*	135.3	6.8
		2)6.7		4)26.9
		3.3500		6.725
		3.3625		3.3625
		2)6.7125		
		3.3562		

SATURDAY, January 16, 1796.

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer broke.—Wind, W. S. W. Moderate.

System Three-fold.

Total Weight 102 lbs. 8 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. 28 lbs.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.8	2.8	3.1	3.1	2.4	2.4
4	6.5	3.7	6.8	3.7	5.6	3.2
6	10.9	4.4	11.0	4.2	9.5	3.9
8	16.0	5.1	15.8	4.8	13.8	4.3
10	21.6	5.6	20.8	5.0	18.5	4.7
12	27.7	6.1	26.2	5.4	23.7	5.2
14	34.1	6.4	31.9	5.7	29.2	5.5
16	40.8	6.7	37.7	5.8	34.9	5.7
18	47.7	6.9	43.8	6.1	40.8	5.9
20	54.7	7.0	49.9	6.1	46.9	6.1
22	61.6	6.9	56.2	6.3	53.1	6.2
24	68.5	6.9	62.6	6.4	59.4	6.3
26	75.4	6.9	69.1	6.5	65.9	6.5
28	82.3	6.9	75.6	6.5	72.4	6.5
30	89.1	6.8	82.2	6.6	78.9	6.5
32	96.0	6.9	88.8	6.6	85.5	6.6
34	102.8	6.8	95.6	6.8	92.1	6.6
36	109.6	6.8	102.4	6.8	98.8	6.7
38	116.4	6.8*	109.0	6.6	105.6	6.8
40	123.2	6.8	115.8	6.8*	112.3	6.7
42	129.9	6.7	122.5	6.7	119.1	6.8*
44	136.6	6.7	129.3	6.8	125.8	6.7
46	.....	.....	136.1	6.8	132.6	6.8
48	.....	.....	.....	.....	139.4	6.8
		4)27.0		27.1		27.1
		2)6.75		6.775		6.775
		3.3750		3.3875		3.3875
		3.3875				
		3.3875				
		3.3500				
		3.3625				
		5)16.8625				
		3.3725 Velocity with a Motive Weight of 33 lbs. 8 oz.				

MONDAY, December 28, 1795.

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 49°;—In the Dock, 45°.—Wind, West, Moderate.

System Three-fold.

Total Wt. 207 lbs.			Motive Wt. 67 lbs.	
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.4	1.4	3.2	3.2
4	4.8	3.4	8.2	5.0
6	9.9	5.1	14.7	6.5
8	16.5	6.6	22.4	7.7
10	24.3	7.8	30.9	8.5
12	32.8	8.5	40.0	9.1
14	41.8	9.0	49.4	9.4
16	51.2	9.4	58.8	9.4
18	60.6	9.4	68.3	9.5
20	70.1	9.5	77.7	9.4
22	79.5	9.4	87.3	9.6
24	88.9	9.4	96.8	9.5
26	98.5	9.6	106.5	9.7*
28	108.1	9.6*	116.1	9.6
30	117.6	9.5	125.8	9.7
32	127.3	9.7	.....	.....
		3)28.8		29.0
		9.6		9.6666
		4.8000		4.8333
		4.8333		
		2)9.6333		
		4.8166		

SATURDAY, January 16, 1796.

Thermometer broke.—Wind, W. S. W. Moderate.

System Three-fold.

Total Wt. 207 lbs.			Motive Wt. 67 lbs.	
Accel. Wt. 56 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.4	2.4	2.5	2.5
4	6.7	4.3	9.1	6.6
6	12.6	5.9	16.1	7.0
8	19.9	7.3	24.4	8.3
10	28.2	8.3	33.7	9.3
12	37.3	9.1	43.3	9.6
14	46.5	9.2	53.2	9.9
16	56.0	9.5	62.9	9.7
18	65.3	9.3	72.5	9.6
20	74.8	9.5	82.1	9.6
22	84.3	9.5	91.7	9.6
24	93.8	9.5	101.4	9.7
26	103.4	9.6	111.1	9.7*
28	113.0	9.6*	120.8	9.7
30	122.7	9.7	130.4	9.6
32	132.3	9.6	.....	.....
		3)28.9		29.0
		9.6333		9.6660
		4.8166		4.8334
		4.8334		
		4.8000		
		4.8333		
		4)19.2833		
		4.8208	Velocity with a Motive Wt. of 67 lbs.	

MONDAY, December 28, 1795.

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 49°;—In the Dock 45°.—Wind, West, Moderate.

System Three-fold.

Total Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.1	3.1	3.2	3.2
4	9.0	5.9	9.2	6.0
6	17.1	8.1	17.5	8.3
8	26.8	9.7	27.4	9.9
10	37.6	10.8	38.5	11.1
12	48.8	11.2	50.3	11.8
14	60.4	11.6	62.3	12.0
16	71.9	11.5	74.3	12.0
18	83.6	11.7	86.2	11.9
20	95.2	11.6	98.0	11.8
22	107.0	11.8	109.8	11.8
24	118.8	11.8*	121.6	11.8
26	.....	.....	133.4	11.8*
		2)11.8		11.8
		5.9		5.9
		5.9		
		2)11.8		
		5.9		

SATURDAY, January 16, 1796.

Thermometer broke.—Wind, W. S. W. Moderate.

System Three-fold.

	lbs. oz.		lbs. oz.
T. W.	307 8	M. W.	100 8
Accelerating Wt. 112 lbs.			
Sec.	Feet.	Differences.	
2	5.5	5.5	
4	13.3	7.8	
6	23.0	9.7	
8	33.5	10.5	
10	44.6	11.1	
12	55.9	11.3	
14	67.3	11.4	
16	78.9	11.6	
18	90.6	11.7	
20	102.4	11.8	
22	114.2	11.8*	
		2)11.8	
		5.9	
		5.9	
		5.9	
		3)17.7	
Velocity with a Motive Wt. of 100 lbs. 8 oz.		5.9	

MONDAY, December 28, 1795.

Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 49°;—In the Dock, 45°.—Wind, West, Moderate.

System Three-fold.

Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.5	5.5	4.2	4.2
4	14.2	8.7	11.9	7.7
6	25.3	11.1	22.1	10.2
8	37.9	12.6	34.2	12.1
10	51.2	13.6	47.4	13.2
12	64.9	13.7	61.1	13.7
14	78.7	13.8	74.8	13.7
16	92.5	13.8	88.7	13.9
18	106.4	13.9*	102.6	13.9
20	120.2	13.8	116.4	13.8
22	.....	.....	130.2	13.8*
		2)27.7		13.8
		2)13.85		6.9
		6.925		
		6.900		
		2)13.8250		
		6.9125		

SATURDAY, January 16, 1796.

Thermometer broke.—Wind, W.S.W. Moderate.

System Three-fold.

Total Wt. 410 lbs. 4 oz.			Motive Wt. 134 lbs.	
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.0	5.0	4.7	4.7
4	13.5	7.5	13.1	8.4
6	24.5	11.0	24.1	11.0
8	37.0	12.5	36.6	12.5
10	50.3	13.5	49.9	13.3
12	63.7	13.4	63.3	13.4
14	77.3	13.6	76.7	13.4
16	91.0	13.7	90.4	13.7
18	104.7	13.7	104.1	13.7
20	118.4	13.7*	117.8	13.7
22	132.2	13.8	131.5	13.7*
		2)27.5		13.7
		2)13.75		6.85
		6.875		
		6.850		
		6.925		
		6.900		
		4)27.5500		
		6.8875 Velocity with a Motive Wt. of 134 lbs.		

MONDAY, December 28, 1795.

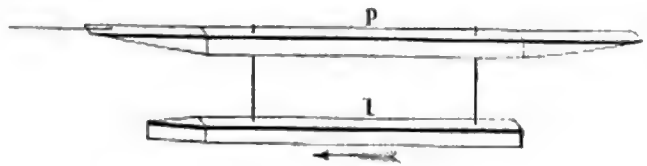
Parallelopipedon p, with the body k attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 49°;—In the Dock, 45°.—Wind, West, Moderate.

System Three-fold.

Total Weight 511 lbs. 4 oz. Motive Weight 167 lbs. 8 oz.						
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.		Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.5	5.5	5.1	5.1	5.0	5.0
4	15.2	9.7	14.5	9.4	14.3	9.3
6	27.9	12.7	26.9	12.4	26.6	12.3
8	41.9	14.0	41.1	14.2	40.7	14.1
10	56.6	14.7	56.0	14.9	55.8	15.1
12	71.6	15.0	71.1	15.1	71.0	15.2
14	86.8	15.2	86.4	15.3	86.3	15.3
16	102.2	15.4	101.8	15.4	101.8	15.5
18	117.6	15.6*	117.3	15.5*	117.3	15.5*
		2)15.6		15.5		15.5
		7.80		7.75		7.75
		7.75				
		7.75				
		3)23.30				
		7.7666 Velocity with a Motive Wt. of 167 lbs. 8 oz.				

Parallelopipedon p, with the body l attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet. Angle of incidence 9° 35′ 40″.



	Motive Weights.							
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment	.....	.....	2.6708	3.8666	5.450	6.7000	7.850	8.7000
Hutt. Correction, or Regular Series	1.3366	1.9045	2.7135	3.8665	5.5093	6.7772	7.850	8.7978

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	2.3732	9.2179	20.385	35.801	55.412	79.180	107.07	139.06	175.12	215.23	259.39	307.55	388.83
Conductor and Bars	1.6627	6.0799	12.981	22.233	33.750	47.466	63.33	81.30	101.34	123.41	147.50	173.57	217.15
Resistance and Friction..	0.7105	3.1380	7.404	13.568	21.662	31.714	43.74	57.76	73.78	91.82	111.89	133.98	171.68
Friction on 107.27 feet..	0.3986	1.5330	3.363	5.865	9.041	12.863	17.33	22.43	28.14	34.49	41.44	49.00	61.72
Plus and Minus Pressure	0.3119	1.605	4.041	7.703	12.621	18.851	26.41	35.33	45.64	57.33	70.45	84.98	109.96
Ditto reduced to one foot	0.2099	1.0802	2.720	5.184	8.494	12.687	17.77	23.78	30.71	38.58	74.41	57.19	74.00

Powers for calculating the Huttonian Correction, or Regular Series.

lbs oz.	lbs. oz.														
16 12 and	33 8	1.8735													
	67 0	1.9437	33 8..	67 0	2.0194										
	100 8	1.9482		100 8	1.9985	67 0..	100 8	1.9636							
	134 0	1.9287		134 0	1.9577		134 0	1.8996	100 8..	134 0	1.8161				
	167 8	1.9453		167 8	1.9846		167 8	1.9591		167 8	1.9557	134..	167 8	2.1704	

15) 29.3641

Mean 33 lbs. 8 oz. and 134 lbs... 1.9576

SATURDAY, January 16, 1796.

Parallelopipedon p, with the body l attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer broke.—Wind, W.S.W. Moderate.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.2	3.2	3.0	3.0	3.6	3.6
8	8.4	5.2	8.1	5.1	9.0	5.4
12	15.1	6.7	14.7	6.6	16.0	7.0
16	23.2	8.1	22.6	7.9	24.2	8.2
20	32.3	9.1	31.7	9.1	33.4	9.2
24	41.9	9.6	41.3	9.6	43.3	9.9
28	52.1	10.2	51.5	10.2	53.4	10.1
32	62.5	10.4	61.7	10.2	63.7	10.3
36	72.8	10.3	72.0	10.3	74.1	10.4
40	83.3	10.5	82.5	10.5	84.5	10.4
44	93.7	10.4	92.9	10.4	95.1	10.6
46	98.9	5.2	98.2	5.3	100.4	5.3
48	104.3	5.4	103.5	5.3	105.6	5.2
50	109.5	5.2	108.7	5.2	110.9	5.3
52	114.9	5.4	114.0	5.3	116.2	5.3
54	120.2	5.3*	119.3	5.3	121.6	5.4*
56	125.5	5.3	124.7	5.4*	126.9	5.3
58	130.9	5.4	130.0	5.3	132.2	5.3
60	136.2	5.3	135.3	5.3	137.6	5.4
62	.....	.....	140.7	5.4	.....	.....
		4)21.3		21.4		21.4
		2)5.325		5.35		5.35
		2.6625		2.675		2.675
		2.6750				
		2.6750				
		3)8.0125				
		2.6708	Velocity with a Motive Weight of 16 lbs. 12 oz.			

SATURDAY, January 16, 1796.

Parallelopipedon p, with the body l attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

System Three-fold.

Total Weight 102 lbs. 8 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. 28 lbs.			A. Wt. 28 lbs.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.1	2.1	3.2	3.2	2.3	2.3
4	5.3	3.2	7.3	4.1	5.3	3.0
6	9.3	4.0	12.2	4.9	9.1	3.8
8	14.2	4.9	17.8	5.6	13.5	4.4
10	19.6	5.4	23.8	6.0	18.3	4.8
12	25.7	6.1	30.5	6.7	23.6	5.3
14	32.3	6.6	37.6	7.1	29.4	5.8
16	39.3	7.0	45.0	7.4	35.6	6.2
18	46.6	7.3	52.4	7.4	41.9	6.3
20	53.9	7.3	60.1	7.7	48.6	6.7
22	61.7	7.8	67.6	7.5	55.4	6.8
24	69.3	7.6	75.3	7.7	62.4	7.0
26	77.0	7.7	83.0	7.7	69.5	7.1
28	84.7	7.7	90.7	7.7	76.8	7.3
30	92.4	7.7	98.4	7.7	84.2	7.4
32	100.2	7.8	106.2	7.8	91.6	7.4
34	107.9	7.7	113.9	7.7	99.1	7.5
36	115.7	7.8*	121.7	7.8*	106.7	7.6
38	123.4	7.7	129.5	7.8	114.2	7.5
40	131.2	7.8	137.2	7.7	121.9	7.7*
42	.....	.....	.....	.....	129.5	7.6
44	.....	.....	.....	.....	137.2	7.7
		3)23.3		23.3		23.0
		2)7.766		7.766		7.666
		3.8833		3.8833		3.8333
		3.8833				
		3.8333				
		3)11.6000				
		3.8666	Velocity with a Motive Weight of 33 lbs. 8 oz.			

TUESDAY, December 29, 1795.

Parallelopipedon p, with the body l attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 55½°;—In the Dock, 46°.—Wind, W. S. W. Strong Breeze.

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 56 lbs.			A. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.5	3.5	2.4	2.4
4	8.8	5.3	6.7	4.3
6	15.8	7.0	12.7	6.0
8	24.0	8.2	20.3	7.6
10	33.2	9.2	28.9	8.6
12	43.2	10.0	38.5	9.6
14	53.6	10.4	48.8	10.3
16	64.3	10.7	59.4	10.6
18	75.2	10.9	70.2	10.8
20	86.0	10.8	80.8	10.6
22	96.8	10.8	91.6	10.8
24	107.7	10.9	102.4	10.8
26	118.6	10.9	113.3	10.9
28	129.5	10.9*	124.2	10.9*
		2)10.9		10.9
		5.45		5.45

SATURDAY, January 16, 1796.

Thermometer broke.—Wind, W. S. W. Moderate.

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 84 lbs.			A. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.8	2.8	3.8	3.8
4	7.4	4.6	9.4	5.6
6	14.0	6.6	16.5	7.1
8	22.3	8.3	24.8	8.3
10	31.8	9.5	34.1	9.3
12	42.0	10.2	44.1	10.0
14	52.6	10.6	54.3	10.2
16	63.1	10.5	64.7	10.4
18	73.8	10.7	75.3	10.6
20	84.5	10.7	85.9	10.6
22	95.3	10.8	96.5	10.6
24	106.2	10.9	107.3	10.8
26	117.1	10.9	118.2	10.9
28	128.0	10.9*	129.1	10.9*
		2)10.9		10.9
		5.45		5.45
		5.45		
		5.45		
		5.45		
		4)21.80		
		5.45 Velocity with a Motive Wt. of 67 lbs.		

TUESDAY, December 29, 1795.

Parallelopipedon p, with the body l attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 55½°;—In the Dock, 46°.—Wind, W.S.W. Strong Breeze.

System Three-fold.

Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.0	3.0	4.0	4.0
4	10.1	7.1	11.8	7.8
6	20.4	10.3	22.7	10.9
8	33.1	12.7	36.0	13.3
10	47.6	14.5	50.6	14.6
12	62.7	15.1	65.9	15.3
14	78.1	15.4	81.4	15.5
16	93.4	15.3	97.0	15.6
18	109.1	15.7*	112.7	15.7*
20	124.8	15.7	128.3	15.6
		2)31.4		31.3
		2)15.7		15.65
		7.850		7.825
		7.825		
		2)15.675		
		7.8375		

See the experiments with 100 lbs. 8 oz. p. 206 and 207.

TUESDAY, January 19, 1796.

Thermometer broke.—Wind, S.S.W. Light Airs.

System Three-fold.

T. W. lbs. oz. 410 4		M. W. lbs. 134
Accelerating Wt. 168 lbs.		
Sec.	Feet.	Differences.
2	5.6	5.6
4	14.9	9.3
6	27.4	12.5
8	41.9	14.5
10	57.6	15.7
12	73.2	15.6
14	88.9	15.7
16	104.7	15.8*
18	120.4	15.7
		2)31.5
		2)15.75
		7.875
		7.850
		7.825
		3)23.550
Velocity with a Motive Wt. of 134 lbs.		7.850

TUESDAY, December 29, 1795.

Parallelopipedon p, with the body l attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 55½°;—In the Dock, 46°.—Wind, W.S.W. Strong Breeze.

System Three-fold.

Total Weight 307 lbs. 8 oz.			Motive Weight 100 lbs. 8 oz.			
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.		Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.6	4.6	4.3	4.3	2.0	2.0
4	11.9	7.3	11.4	7.1	7.1	5.1
6	21.4	9.5	20.7	9.3	14.9	7.8
8	32.5	11.1	31.8	11.1	24.8	9.9
10	44.9	12.4	44.3	12.5	36.4	11.6
12	57.9	13.0	57.3	13.0	48.9	12.5
14	71.1	13.2	70.5	13.2	61.9	13.0
16	84.4	13.3	83.7	13.2	75.3	13.4
18	97.7	13.3	96.9	13.2	88.7	13.4
20	111.1	13.4	110.3	13.4	102.1	13.4
22	124.5	13.4*	123.7	13.4*	115.5	13.4
24	.....	.....	.....	.....	128.9	13.4*
		2)13.4		13.4		13.4
		6.7		6.7		6.7

SATURDAY, January 16, 1796.

Parallelopipedon p, with the body I attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer broke.

System Three-fold.

T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. 56 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.7	3.7	3.9	3.9
4	9.9	6.2	10.6	6.7
6	18.3	8.4	19.6	9.0
8	28.5	10.2	30.2	10.6
10	40.0	11.5	41.5	11.3
12	52.2	12.2	53.8	12.3
14	64.8	12.6	66.3	12.5
16	77.7	12.9	79.3	13.0
18	90.8	13.1	92.4	13.1
20	104.1	13.3	105.8	13.4
22	117.5	13.4	119.2	13.4
24	130.9	13.4*	132.6	13.4*
	2)13.4			13.4
	6.7			6.7
	6.7			
	6.7			
	6.7			
	6.7			
	5)33.5			
	6.7	Velocity with a Motive Weight of 100 lbs. 8 oz.		

MONDAY, December 28, 1795.

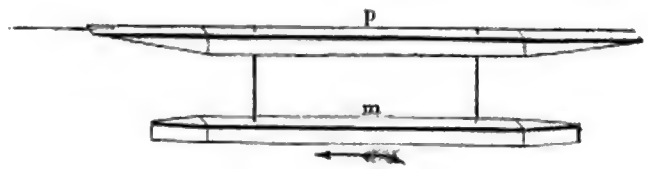
Parallelopipedon p, with the body l attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 49°;—In the Dock 45°.—Wind, West, Moderate.

System Three-fold.

Total Weight 511 lbs. 4 oz. Motive Weight 167 lbs. 8 oz.						
Accel Wt. 112 lbs.			Accel. Wt. 112 lbs.		Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.6	3.6	4.3	4.3	5.8	5.8
4	11.8	7.2	13.4	9.1	15.9	10.1
6	23.7	11.9	26.1	12.7	29.3	13.4
8	38.5	14.8	41.3	15.2	45.2	15.9
10	54.7	16.2	57.8	16.5	61.7	16.5
12	71.5	16.8	74.7	16.9	79.0	17.3
14	88.5	17.0	92.1	17.4	96.2	17.2
16	105.8	17.3*	109.5	17.4*	113.8	17.6*
18	123.1	17.3	127.0	17.5	131.1	17.3
		2)34.6		34.9		34.9
		2)17.3		17.45		17.45
		8.650		8.725		8.725
		8.725				
		8.725				
		3)26.100				
		8.700 Velocity with a M. Wt. of 167 lbs. 8 oz.				

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet. The bars 9 feet 8 inches asunder. Angle of incidence 9° 35′ 40″.



	Motive Weights.									
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment.....	.....	.....	2.7749	3.9958	5.5833	6.9562	8.1666	9.2500
Hutt. Correction, or Regular Series	1.3343	1.9233	2.7722	3.9958	5.7595	7.1329	8.3017	9.3387

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	2.4237	9.0198	19.456	33.566	51.243	72.403	96.980	124.92	156.17	190.70	228.47	269.44	338.15
Conductor and Bars.....	1.6627	6.0799	12.981	22.233	33.750	47.466	63.33	81.30	101.34	123.41	147.50	173.57	217.15
Resistance and Friction..	0.7610	2.9399	6.475	11.333	17.493	24.937	33.650	43.62	54.83	67.29	80.97	95.87	121.00
Friction on 111.67 feet..	0.4150	1.5960	3.501	6.105	9.412	13.391	18.04	23.35	29.30	35.90	43.14	51.01	64.25
Plus and Minus Pressure	0.3460	1.3439	2.974	5.228	8.081	11.546	15.61	20.27	25.53	31.39	37.83	44.86	†57.75
Ditto reduced to one foot	0.2329	0.9044	2.001	3.518	5.438	7.770	10.50	13.64	17.18	21.12	25.46	30.19	38.87

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs.	oz.														
16 12 and	33	8	1.9010													
	67	0	1.9829	33	8.. 67	0	2.0719									
	100	8	1.9496		100	8	1.9816	67..	100	8	1.8443					
	134	0	1.9264		134	0	1.9394		134	0	1.8228	100	8.. 134	0	1.7934	
	167	8	1.9125		167	8	1.9174		167	8	1.8108		167	8	1.7925	134.. 167 8	1.7913

15)28.4378

Mean 16 lbs. 12 oz. and 33 lbs. 8 oz... 1.8959

† Query 56.75?

SATURDAY, December 26, 1795.

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 42½°;—In the Dock, 46°.—Wind, Light Airs, Easterly.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accel. Wt. 28 lbs.			A. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.6	2.6	3.1	3.1
8	9.4	6.8	8.5	5.4
12	17.2	7.8	16.0	7.5
16	26.5	9.3	25.0	9.0
20	37.0	10.5	34.9	9.9
24	48.0	11.0	45.9	11.0
28	59.2	11.2	56.7	10.8
32	70.6	11.4	67.8	11.1
36	81.7	11.1	78.8	11.0
40	92.9	11.2	89.9	11.1
44	104.0	11.1	101.1	11.2
46	109.6	5.6	106.6	5.5
48	115.2	5.6	112.2	5.6
50	120.7	5.5*	117.7	5.5*
52	126.2	5.5	123.3	5.6
54	131.8	5.6	128.9	5.6
		3)16.6		16.7
		2)5.533		5.566
		2.7666		2.7833
		2.7833		
		2)5.5499		
		2.7749		

FRIDAY, January 15, 1796.

Thermometer broke.—Wind, W.S.W. Fresh Breeze.

System Three-fold.

Total Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.4	4.4	4.1	4.1
8	11.3	6.9	10.7	8.6
12	19.8	8.5	18.9	8.2
16	29.7	9.9	28.6	9.7
20	40.7	11.0	39.4	10.8
24	51.8	11.1	50.5	11.1
28	63.3	11.5	61.8	11.3
32	74.4	11.1	73.0	11.2
36	85.6	11.2	84.2	11.2
40	96.7	11.1	95.3	11.1
42	102.3	5.6	106.5	11.2
44	107.8	5.5	112.1	5.6
46	113.3	5.5	117.6	5.5
48	118.9	5.6	123.2	5.6
50	124.5	5.6	128.7	5.5
52	130.0	5.5	134.3	5.6*
54	135.5	5.5*	139.8	5.5
56	141.1	5.6	.....	.....
		2)11.1		11.1
		2)5.55		5.55
		2.775		2.775
		2.775		
		2)5.550		
		2.7750		
		2.7749 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

SATURDAY, December 26, 1795.

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 42½°;—In the Dock, 46°.—Wind, Light Airs, Easterly.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.8	1.8	2.2	2.2
4	4.9	3.1	5.6	3.4
6	9.1	4.2	10.1	4.5
8	14.4	5.3	15.6	5.5
10	20.4	6.0	21.9	6.3
12	27.2	6.8	28.9	7.0
14	34.6	7.4	36.6	7.7
16	42.5	7.9	44.7	8.1
18	49.9	7.4	52.2	7.5
20	58.1	8.2	60.4	8.2
22	66.2	8.1	68.4	8.0
24	74.2	8.0	76.5	8.1
26	82.1	7.9	84.5	8.0
28	90.1	8.0	92.5	8.0
30	98.0	7.9	100.5	8.0
32	106.0	8.0	108.4	7.9*
34	114.0	8.0*	116.5	8.1
36	122.0	8.0	124.5	8.0
38	130.0	8.0	.....	.....
		3)24.0		24.0
		2)8.0		8.0
		4.0		4.0
		4.0		
		2)8.0		
		4.0		

FRIDAY, January 15, 1796.

Thermometer broke.—Wind, W.S.W. Fresh Breeze.

System Three-fold.

T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 40 lbs.			Accel. Wt. 40 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.6	3.6	2.9	2.9
4	8.1	4.5	6.9	4.0
6	13.4	5.3	11.8	4.9
8	19.4	6.0	17.6	5.8
10	26.0	6.6	23.9	6.3
12	33.2	7.2	30.9	7.0
14	40.8	7.6	38.3	7.4
16	48.6	7.8	45.9	7.6
18	56.7	8.1	54.0	8.1
20	64.7	8.0	61.8	7.8
22	73.0	8.3	70.1	8.3
24	81.0	8.0	78.2	8.1
26	89.0	8.0	86.2	8.0
28	97.0	8.0	94.2	8.0
30	105.1	8.1	102.2	8.0
32	113.1	8.0	110.2	8.0
34	121.1	8.0*	118.2	8.0*
36	.....	.....	126.1	7.9
38	.....	.....	134.1	8.0
		2)8.0		3)23.9
		4.0000		7.966
		3.9833		
		4.0000		3.9833
		4.0000		
		4)15.9833		
		3.9958	Velocity with a Motive Wt. of 33 lbs. 8 oz.	

WEDNESDAY, December 23, 1795.

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 48°;—In the Dock, 47°.—Wind, W. S. W. Fresh Breeze.

System Three-fold.

Total Wt. 207 lbs.			Motive Wt. 67 lbs.	
Accel. Wt. 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.5	1.5	2.6	2.6
4	5.3	3.8	7.5	4.9
6	10.9	5.6	14.2	6.7
8	18.4	7.5	22.3	8.1
10	27.2	8.8	31.8	9.5
12	37.1	9.9	42.1	10.3
14	47.8	10.7	53.0	10.9
16	58.7	10.9	63.9	10.9
18	69.7	11.0	74.9	11.0
20	80.8	11.1	85.9	11.0
22	91.9	11.1	97.0	11.1
24	103.1	11.2*	108.1	11.1*
26	114.2	11.1	119.2	11.1
28	125.4	11.2	130.3	11.1
30	136.4	11.0	.....	.....
		4)44.5		3)33.3
		2)11.125		11.1
		5.5625		5.55
		5.5500		
		2)11.1125		
		5.5562		

FRIDAY, January 15, 1796.

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer broke.—Wind, W. S. W. Fresh Breeze.

System Three-fold.

Total Weight 207 lbs. Motive Weight 67 lbs.						
Accel. Wt. 112 lbs.			A. Wt. 112 lbs.		A. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.0	3.0	5.4	5.4	5.5	5.5
4	8.3	5.3	12.9	7.5	13.0	7.5
6	15.8	7.5	22.1	9.2	22.1	9.1
8	24.9	9.1	32.3	10.2	32.3	10.2
10	35.1	10.2	43.2	10.9	43.1	10.8
12	46.0	10.9	54.2	11.0	54.2	11.1
14	57.1	11.1	65.3	11.1	65.3	11.1
16	68.2	11.1	76.3	11.0	76.3	11.0
18	79.3	11.1	87.4	11.1	87.4	11.1
20	90.4	11.1	98.5	11.1	98.6	11.2
22	101.6	11.2*	109.7	11.2*	109.8	11.2*
24	112.7	11.1	120.9	11.2	121.0	11.2
26	123.9	11.2	132.2	11.3	132.2	11.2
28	135.1	11.2	.....	.....	.....	.....
		4)44.7		3)33.7		33.6
		2)11.175		11.2333		11.2
		5.5875		5.6166		5.6
		5.6166				
		5.6000				
		5.5625				
		5.5500				
		5)27.9166				
		5.5833 Velocity with a Motive Weight of 67 lbs.				

WEDNESDAY, December 23, 1795.

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 48°;—In the Dock, 47°.—Wind, W. S. W. Fresh Breeze.

System Three-fold.

Total Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accel. Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.9	3.9	3.5	3.5
4	10.8	6.9	10.1	6.6
6	20.2	9.4	19.2	9.1
8	31.6	11.4	30.5	11.3
10	44.2	12.6	43.0	12.5
12	57.2	13.0	56.3	13.3
14	70.6	13.4	70.0	13.7
16	84.1	13.5	83.7	13.7
18	97.8	13.7	97.6	13.9
20	111.7	13.9*	111.6	14.0*
22	125.6	13.9	125.5	13.9
		2)27.8		27.9
		2)13.9		13.95
		6.950		6.975
		6.975		
		2)13.925		
		6.9625		

FRIDAY, January 15, 1796.

Thermometer broke.—Wind, W. S. W. Fresh Breeze.

System Three-fold.

Total Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.1	6.1	3.6	3.6
4	14.9	8.8	10.3	6.7
6	25.9	11.0	19.5	9.2
8	38.2	12.3	30.7	11.2
10	51.3	13.1	43.3	12.6
12	64.7	13.4	56.5	13.2
14	78.3	13.6	70.0	13.5
16	91.9	13.6	83.7	13.7
18	105.7	13.8	97.3	13.6
20	119.6	13.9*	111.2	13.9
22	.....	.....	125.1	13.9*
		2)13.9		13.9
		6.950		6.95
		6.950		
		6.950		
		6.975		
		4)27.825		
		6.9562 Velocity with a Motive Wt. of 100 lbs. 8 oz.		

WEDNESDAY, December 23, 1795.

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

Thermometer in the Air, 48°;—In the Dock, 47°.—Wind, W. S. W. Fresh Breeze.

System Three-fold.

Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.						
Accelerating Wt. 140 lbs.			Accel. Wt. 168 lbs.		Accel. Wt. 168 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.3	2.3	3.2	3.2	4.4	4.4
4	8.7	6.4	10.5	7.3	13.0	8.6
6	18.9	10.2	21.6	11.1	25.0	12.0
8	31.7	12.8	35.4	13.8	39.4	14.4
10	46.1	14.4	50.6	15.2	55.0	15.6
12	61.7	15.6	66.3	15.7	71.0	16.0
14	77.5	15.8	82.3	16.0	87.2	16.2
16	93.6	16.1	98.4	16.1	103.6	16.4
18	109.8	16.2	114.8	16.4	119.9	16.3*
20	126.2	16.4*	131.1	16.3*	.....	.....
		2)16.4		16.3		16.3
		8.20		8.15		8.15
		8.15				
		8.15				
		2)24.50				
		8.1666 Velocity with a Motive Weight of 134 lbs.				

WEDNESDAY, December 23, 1795.

Parallelopipedon p, with the body m attached to it by means of two circular iron bars, the centre of the lower body being immersed six feet.

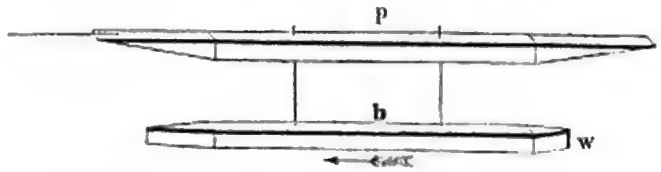
System Three-fold.

T. Wt. 511 lbs. 4 oz.			M. Wt. 167 lbs. 8 oz.	
Accel. Wt. 194 lbs.			Accel. Wt. 194 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.2	4.2	5.7	5.7
4	13.6	9.4	16.6	10.9
6	27.1	13.5	31.3	14.7
8	43.3	16.2	48.2	16.9
10	61.0	17.7	66.1	17.9
12	79.1	18.1	84.4	18.3
14	97.5	18.4*	102.9	18.5*
16	116.1	18.6	121.4	18.5
		2)37.0		37.0
		2)18.5		18.5
		9.25		9.25
		9.25		
		2)18.50		
		9.25 Velocity with a M. Wt. of 167 lbs. 8 oz.		

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

Length of the wedge at the foremost end 3.6058 feet. Length of the oblique side 3.657 feet. Angle of incidence 9° 35′ 40″.

Length of the wedge at the hindmost part 2.3606 feet. Length of the oblique side 2.438 feet. Angle of incidence 14° 28′ 39″.



	Motive Weights.											
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8				
Velocity per Experiment	.....	.....	2.7687	3.9333	5.5812	6.9312	8.050	8.9916				
Hutt. Correction, or Regular Series	1.3513	1.9295	2.7548	3.9332	5.6156	6.9162	8.0178	8.9916				

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	2.3301	8.9812	19.774	34.616	53.447	76.214	102.88	133.42	167.81	206.00	248.00	293.75	370.90
Conductor and Bars.....	1.6627	6.0800	12.981	22.233	33.750	47.466	63.33	81.30	101.34	123.41	147.50	173.57	217.15
Resistance and Friction ..	0.6674	2.9012	6.793	12.383	19.697	28.748	39.55	52.12	66.47	82.59	100.50	120.18	153.75
Friction on 110.21 feet..	0.4095	1.5751	3.455	6.025	9.289	13.215	17.80	23.04	28.92	35.43	42.57	50.35	63.41
Plus and Minus Pressure	0.2579	1.3261	3.338	6.358	10.408	15.533	21.75	29.08	37.55	47.16	57.93	69.83	90.34
Ditto reduced to one foot	0.1736	0.8924	2.246	4.279	7.004	10.454	14.637	19.57	25.27	31.74	38.99	47.10	60.80

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.														
16 12 and	33 8	1.9742													
	67 0	1.9776	33 8..67 0	1.9808											
	100 8	1.9525	100 8	1.9391	67 0..100 8	1.8717									
	134 0	1.9483	134 0	1.9356	134 0	1.8924	100 8..134 0	1.9225							
	167 8	1.9548	167 8	1.9465	167 8	1.9214	167 8	1.9627	134..167 8	2.0172					

15)29.1973

Mean 33 lbs. 8 oz. and 167 lbs. 8 oz... 1.9465

WEDNESDAY, December 30, 1795.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

Thermometer in the Air, 43½°;—In the Dock, 45°.—Wind, N. W. Fresh Breeze.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accel. Wt. 32 lbs.			Accel. Wt. 32 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.4	3.4	3.3	3.3
8	9.4	6.0	9.2	5.9
12	17.0	7.6	16.9	7.7
16	26.3	9.3	26.2	9.3
20	36.3	10.0	36.4	10.2
24	46.8	10.5	46.9	10.5
28	57.4	10.6	57.6	10.7
32	68.1	10.7	68.3	10.7
36	78.8	10.7	79.0	10.7
40	89.5	10.7	89.7	10.7
44	100.4	10.9	95.1	5.4
46	105.8	5.4	100.5	5.4
48	111.2	5.4	105.9	5.4
50	116.7	5.5	111.3	5.4
52	122.2	5.5	116.8	5.5
54	127.6	5.4	122.3	5.5
56	133.1	5.5	127.7	5.4
58	138.6	5.5*	133.2	5.5
60	.....	.....	138.7	5.5*
		2)5.5		5.5
		2.75		2.75
		2.75		
		2)5.50		
		2.75		

† Query 70.0?

SATURDAY, January 2, 1796.

Thermometer in the Air, 47°;—In the Dock, 44°.—Wind, S. W. Moderate.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.1	2.1	2.8	2.8
8	6.3	4.2	7.7	4.9
12	12.3	6.0	14.2	6.5
16	19.9	7.6	22.2	8.0
20	28.5	8.6	31.3	9.1
24	38.2	9.7	41.2	9.9
28	48.5	10.3	51.9	10.7
32	59.2	10.7	62.7	10.8
36	70.2†	10.8	73.6	10.8
40	80.9	10.9	84.5	10.9
44	91.8	10.9	95.3	10.8
48	102.8	11.0	100.8	5.5
50	108.3	5.5	106.2	5.4
52	113.8	5.5	111.7	5.5
54	119.3	5.5	117.2	5.5
56	124.9	5.6	122.7	5.5
58	130.5	5.6*	128.2	5.5*
60	136.1	5.6	133.8	5.6
		2)11.2		11.1
		2)5.6		5.55
		2.800		2.775
		2.775		
		2.750		
		2.750		
		4)11.075		
		2.7687 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

WEDNESDAY, December 30, 1795.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

Thermometer in the Air, 43¼°;—In the Dock, 45°.—Wind, N.W. Fresh Breeze.

System Three-fold.

T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 36 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.8	2.8	4.8	4.8
4	6.6	3.8	8.7	3.9
6	11.2	4.6	13.5	4.8
8	16.6	5.4	19.0	5.5
10	22.4	5.8	25.2	6.2
12	28.8	6.4	31.9	6.7
14	35.8	7.0	39.1	7.2
16	42.6	6.8	46.3	7.2
18	50.0	7.4	53.7	7.4
20	57.5	7.5	61.2	7.5
22	65.1	7.6	68.8	7.6
24	72.7	7.6	76.3	7.5
26	80.3	7.6	84 0	7.7
28	88.0	7.7	91.7	7.7
30	95.7	7.7	99.4	7.7
32	103.4	7.7	107.2	7.8
34	111.2	7.8	115.0	7.8*
36	119.0	7.8*	122.9	7.9
38	127.0	8.0	130.7	7.8
		2)15.8		3)23.5
		2)7.9		7.833
		3.9500		3.9166
		3.9166		
		2)7.8666		
		3.9333		

SATURDAY, January 2, 1796.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

Thermometer in the Air, 47°;—In the Dock 44°.—Wind, S.W. Moderate.

System Three-fold.

Total Weight 102 lbs. 8 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. 28 lbs.			A. Wt. 28 lbs.		A. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.4	5.4	4.3	4.3	5.5	5.5
8	14.3	8.9	12.4	8.1	14.6	9.1
12	26.2	11.9	23.6	11.2	26.5	11.9
16	40.0	13.8	37.0	13.4	40.3	13.8
20	54.8	14.8	51.5	14.5	55.0	14.7
24	70.2	15.4	66.8	15.3	70.2	15.2
28	85.7	15.5	82.2	15.4	85.5	15.3
32	101.2	15.5	97.7	15.5	100.9	15.4
34	109.0	7.8	105.5	7.8	108.6	7.7
36	116.8	7.8*	113.4	7.9*	116.5	7.9*
38	124.7	7.9	121.2	7.8	124.4	7.9
40	132.5	7.8	129.2	8.0	132.2	7.8
		3)23.5		23.7		23.6
		2)7.833		7.9		7.866
		3.9166		3.95		3.9333
		3.9500				
		3.9334				
		3.9500				
		3.9166				
		5)19.6666				
		3.9333 Velocity with a Motive Weight of 33 lbs. 8 oz.				

WEDNESDAY, December 30, 1795.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

Thermometer in the Air, 43½°;—In the Dock, 45°.—Wind, N. W. Fresh Breeze.

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.4	3.4	7.2	7.2
4	8.9	5.5	15.8	8.6
6	16.2	7.3	25.5	9.7
8	24.8	8.6	35.8	10.3
10	34.6	9.8	46.7	10.9
12	44.9	10.3	57.4	10.7
14	55.7	10.8	68.3	10.9
16	66.4	10.7	79.2	10.9
18	77.2	10.8	90.2	11.0
20	88.1	10.9	101.2	11.0
22	99.0	10.9	112.3	11.1
24	110.1	11.1	123.4	11.1*
26	121.2	11.1	.....	.....
28	132.3	11.1*	.....	.....
		2)11.1		11.1
		5.55		5.55

FRIDAY, January 1, 1796.

Thermometer in the Air, 42°;—In the Dock, 45°.—Wind, S. W. Light Breeze.

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accel. Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet	Differences.	Feet.	Differences.
2	3.0	3.0	3.7	3.7
4	7.9	4.9	9.5	5.8
6	14.5	6.6	16.8	7.3
8	22.4	7.9	25.4	8.6
10	31.5	9.1	34.9	9.5
12	41.5	10.0	45.1	10.2
14	52.1	10.6	55.9	10.8
16	63.0	10.9	66.8	10.9
18	74.0	11.0	77.9	11.1
20	85.0	11.0	89.0	11.1
22	96.1	11.1	100.2	11.2
24	107.2	11.1	111.3	11.1
26	118.5	11.3*	122.5	11.2*
28	129.7	11.2	133.7	11.2
		2)22.5		22.4
		2)11.25		11.2
		5.625		5.6
		5.600		
		5.550		
		5.550		
		4)22.325		
		5.5812 Velocity with a Motive Wt. of 67 lbs.		

WEDNESDAY, December 30, 1795.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

Thermometer in the Air, 43½°;—In the Dock, 45°.—Wind, N. W. Fresh Breeze.

System Three-fold.

T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accel. Wt. 112 lbs.			A. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.6	3.6	5.1	5.1
4	10.4	6.8	13.2	8.1
6	19.7	9.3	23.6	10.4
8	31.0	11.3	35.6	12.0
10	43.3	12.3	48.3	12.7
12	56.4	13.1	61.5	13.2
14	69.6	13.2	74.9	13.4
16	83.2	13.6	88.5	13.6
18	96.6	13.4	102.2	13.7
20	110.4	13.8	106.0	13.8
22	124.2	13.8*	129.8	13.8*
		2)13.8		13.8
		6.9		6.9

FRIDAY, January 1, 1796.

Thermometer in the Air, 42°;—In the Dock, 45°.—Wind, S. W. Light Breeze.

System Three-fold.

T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accel. Wt. 112 lbs.			A. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.7	2.7	5.1	5.1
4	8.7	6.0	13.0	7.9
6	17.3	8.6	23.1	10.1
8	28.0	10.7	35.1	12.0
10	40.4	12.4	48.3	13.2
12	53.8	13.4	62.0	13.7
14	67.6	13.8	75.7	13.7
16	81.4	13.8	89.6	13.9
18	95.2	13.8	103.4	13.8
20	109.1	13.9*	117.3	13.9*
22	123.1	14.0	131.2	13.9
		2)27.9		27.8
		2)13.95		13.9
		6.975		6.95
		6.950		
		6.900		
		6.900		
		4)27.725		
		6.9312	Velocity with a M. Wt. of 100 lbs. 8 oz.	

FRIDAY, January 1, 1796.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

System Three-fold.

Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.								
Accel. Wt. 112 lbs.		A. Wt. 112 lbs.		A. Wt. 112 lbs.		A. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.3	4.3	6.3	6.3	5.2	5.2	4.9	4.9
4	12.3	8.0	16.0	9.7	13.9	8.7	13.4	8.5
6	23.5	11.2	28.4	12.4	25.6	11.7	24.8	11.4
8	37.1	13.6	42.6	14.2	39.3	13.7	38.6	13.8
10	51.8	14.7	57.7	15.1	54.5	15.2	53.6	15.0
12	67.2	15.4	73.4	15.7	70.1	15.6	69.2	15.6
14	83.0	15.8	89.3	15.9	86.0	15.9	85.0	15.8
16	99.1	16.1	105.4	16.1	102.2	16.2	101.0	16.0
18	115.2	16.1*	121.5	16.1*	118.2	16.0*	117.1	16.1*
20	.....	.....	.....	.....	134.4	16.2	133.2	16.1
		2)16.1		16.1		32.2		32.2
		8.05		8.05		16.1		16.1
		8.05						
		8.05				8.05		8.05
		8.05						
		4)32.20						
		8.05 Velocity with a Motive Weight of 134 lbs.						

FRIDAY, January 1, 1796.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called w, the centre of the lower body being immersed six feet.

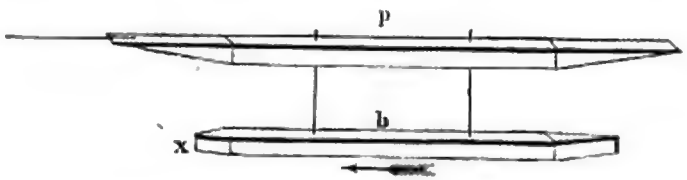
System Three-fold.

Total Weight 511 lbs. 4 oz. Motive Weight 167 lbs. 8 oz.						
Accel. Wt. 168 lbs.			A. Wt. 168 lbs.		A. Wt. 168 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.7	6.7	5.2	5.2	5.7	5.7
4	18.2	11.5	15.0	9.8	16.1	10.4
6	33.1	14.9	28.8	13.8	30.3	14.2
8	49.8	16.7	44.9	16.1	46.6	16.3
10	67.3	17.5	62.2	17.3	64.1	17.5
12	85.0	17.7	79.9	17.7	81.8	17.7
14	103.0	18.0*	97.8	17.9	99.8	18.0
16	120.9	17.9	115.7	17.9*	117.9	18.1*
		2)35.9		17.9		18.1
		2)17.95		8.95		9.05
		8.975				
		8.950				
		8.050				
		3)26.975				
		8.9916 Velocity with a Motive Weight of 167 lbs. 8 oz.				

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called x, the centre of the lower body being immersed six feet.

Length of the wedge at the foremost end 2.3606 feet. Length of the oblique side 2.438 feet. Angle of incidence 14° 28′ 39″.

Length of the wedge at the hindmost part 3.6058 feet. Length of the oblique side 3.657 feet. Angle of incidence 9° 35′ 40″.



	Motive Weights.									
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8		
Velocity per Experiment	. . . . .	. . . . .	2.7312	3.8833	5.5875	7.000	8.0583	9.1250		
Hutt. Correction, or Regular Series	1.3004	1.8724	2.6968	3.8843	5.5948	6.9259	8.0583	9.0627		

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	2.5441	9.4928	20.508	35.421	†34.118	76.519	102.55	132.16	165.30	201.93	242.02	285.51	‡258.47
Conductor and Bars	1.6627	6.0800	12.981	22.233	33.750	47.466	63.33	81.30	101.34	123.41	147.50	173.57	217.15
Resistance and Friction . .	0.8814	3.4128	7.527	13.188	20.368	29.053	39.22	50.86	63.96	78.52	94.52	111.94	141.32
Friction on 110.21 feet . .	0.4095	1.5751	3.455	6.025	9.289	13.215	17.80	23.04	28.92	35.43	42.57	50.35	63.41
Plus and Minus Pressure	0.4719	1.8377	4.072	7.163	11.079	15.838	21.42	27.82	35.04	43.09	51.95	61.59	77.91
Ditto reduced to one foot	0.3176	1.2367	2.740	4.821	7.456	10.659	14.41	18.72	23.58	29.00	34.96	41.45	52.43

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.		lbs. oz.														
16 12 and	33 8	1.9694														
	67 0	1.9367	33 8 . .	67 0	1.9050											
	100 8	1.9038		100 8	1.8422	67 0 . .	100 8	1.7990								
	134 0	1.9219		134 0	1.8990		134 0	1.8930	100 8 . .	134 0	2.0433					
	167 8	1.9089		167 8	1.8838		167 8	1.8682		167 8	1.9270	134 . .	167 8	1.7950		

15)28.4962

Mean 33 lbs. 8 oz. and 134 lbs. . . . 1.8997

† Query 54.118?

‡ Query 358.47?

Digitized by Google

WEDNESDAY, December 30, 1795.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called x, the centre of the lower body being immersed six feet.

Thermometer in the Air, 43½°;—In the Dock, 45°.—Wind, N. W. Fresh Breeze.

System Three-fold.

Total Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.2	2.2	2.8	2.8
8	6.6	4.4	7.7	4.9
12	12.6	6.0	14.2	6.5
16	20.2	7.6	21.9	7.7
20	29.0	8.8	30.9	9.0
24	38.7	9.7	40.8	9.9
28	48.7	10.0	50.9	10.1
32	59.3	10.6	61.5	10.6
36	69.9	10.6	72.0	10.5
40	80.5	10.6	82.6	10.6
42	85.8	5.3	93.2	10.6
44	91.2	5.4	98.5	5.3
46	96.5	5.3	103.8	5.3
48	101.9	5.4	109.1	5.3
50	107.3	5.4	114.5	5.4
52	112.3	5.0	119.8	5.3
54	117.6	5.3	125.2	5.4
56	123.0	5.4*	130.7	5.5*
58	128.4	5.4	136.1	5.4
		2)10.8		10.9
		2)5.4		5.45
		2.700		2.725
		2.725		
		2)5.425		
		2.7125		

SATURDAY, January 2, 1796.

Thermometer in the Air, 47°;—In the Dock 44°.—Wind, S. W. Moderate.

System Three-fold.

Total Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.9	2.9	2.9	2.9
8	7.7	4.8	7.7	4.8
12	14.2	6.5	14.2	6.5
16	22.2	8.0	22.1	7.9
20	31.2	9.0	31.1	9.0
24	41.2	10.0	41.1	10.0
28	51.7	10.5	51.6	10.5
32	62.4	10.7	62.3	10.7
36	73.2	10.8	73.0	10.7
40	84.1	10.9	83.8	10.8
44	94.9	10.8	94.6	10.8
46	100.4	5.5	100.1	5.5
48	105.7	5.3	105.6	5.5
50	111.2	5.5	111.1	5.5
52	116.6	5.4	116.6	5.5
54	122.0	5.4	122.1	5.5
56	127.4	5.4	127.6	5.5
58	132.9	5.5	133.1	5.5*
60	138.4	5.5*	.....	.....
		2)5.5		5.5
		2.750		2.75
		2.750		
		2.700		
		2.725		
		4)10.925		
		2.7312 Velocity with a Motive Wt. of 16 lbs. 12 oz.		

Digitized by Google

WEDNESDAY, December 30, 1795. SATURDAY, January 2, 1796.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called x, the centre of the lower body being immersed six feet.

Thermometer in the Air, 47°;—In the Dock, 44°.—Wind, S. W. Moderate.

System Three-fold.

T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.3	7.3	2.3	2.3
8	17.6	10.3	5.5	3.2
12	30.3	12.7	9.6	4.1
16	44.2	13.9	14.5	4.9
20	58.8	14.6	20.1	5.6
24	73.8	15.0	26.1	6.0
28	88.7	14.9	33.7	7.6
30	96.4	7.7	39.8	6.1
32	104.1	7.7	46.8	7.0
34	111.7	7.6	54.0	7.2
36	119.4	7.7*	61.5	7.5
38	127.2	7.8	68.9	7.4
			76.4	7.5
		2)15.5	84.0	7.6
			91.5	7.5
		2)7.75	99.1	7.6
			106.8	7.7
		3.875	114.6	7.8*
			124.3	7.7
				2)15.5
				2)7.75
				3.875†

† The second experiment was read off to two seconds.

System Three-fold.

T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accel. Weight 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.0	3.0	5.0	5.0
8	10.0	7.0	13.8	8.8
12	20.3	10.3	25.4	11.6
16	33.0	12.7	39.0	13.6
20	47.2	14.2	53.7	14.7
24	62.3	15.1	68.7	15.0
28	77.5	15.2	84.2	15.5
32	93.0	15.5	99.7	15.5
34	100.8	7.8	107.5	7.8
36	108.6	7.8	115.2	7.7*
38	116.4	7.8	123.0	7.8
40	124.2	7.8	130.8	7.8
42	132.0	7.8*	.....	.....
		2)7.8		3)23.3
		3.9000		2)7.766
		3.8833		3.8833
		3.8750		
		3.8750		
		4)15.5333		
		3.8833 Velocity with a Motive Wt. 33 lbs. 8 oz.		

FRIDAY, January 1, 1796.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called x, the centre of the lower body being immersed six feet.

Thermometer in the Air, 42°;—In the Dock, 45°.—
Wind, S. W. Light Breeze.

System Three-fold.

Total Wt. 207 lbs.		M. Wt. 67 lbs.		
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.9	3.9	4.0	4.0
4	9.6	5.7	9.9	5.9
6	16.8	7.2	17.1	7.2
8	25.3	8.5	25.7	8.6
10	34.7	9.4	35.2	9.5
12	44.9	10.2	45.5	10.3
14	55.6	10.7	56.3	10.8
16	66.6	11.0	67.3	11.0
18	77.5	10.9	78.3	11.0
20	88.6	11.1	89.3	11.0
22	99.7	11.1	100.4	11.1
24	110.9	11.2	111.5	11.1
26	122.0	11.1*	122.7	11.2*
28	133.2	11.2	133.9	11.2
		2)22.3		22.4
		2)11.15		11.2
		5.575		5.6
		5.600		
		2)11.175		
		5.5875 Velocity with a Motive Weight of 67 lbs.		

System Three-fold.

T. Wt. 307 lbs. 8 oz.		M. Wt. 100 lbs. 8 oz.		
Accelerating Wt. 112 lbs.			A. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.9	3.9	2.8	2.8
4	10.9	7.0	8.7	5.9
6	20.5	9.6	17.3	8.6
8	31.9	11.4	28.0	10.7
10	44.7	12.8	40.5	12.5
12	58.0	13.3	53.9	13.4
14	71.9	13.9	67.8	13.9
16	85.7	13.8	81.7	13.9
18	99.6	13.9	95.5	13.8
20	113.5	13.9*	109.5	14.0*
22	127.6	14.1	123.5	14.0
		2)28.0		28.0
		2)14.0		14.0
		7.0		7.0
		7.0		
		2)14.0		
		7.0 Velocity with a Motive Wt. of 100 lbs. 8 oz.		

FRIDAY, January 1, 1796.

Parallelopipedon p with parallelopipedon b, lengthened by the addition of a wedge at each extremity, called x, the centre of the lower body being immersed six feet.

System Three-fold.

Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.						
Accel. Wt. 112 lbs.			A. Wt. 112 lbs.		A. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.1	4.1	4.3	4.3	6.3	6.3
4	12.3	8.2	12.3	8.0	16.0	9.7
6	23.5	11.2	23.5	11.2	28.4	12.4
8	37.1	13.6	37.1	13.6	42.6	14.2
10	51.9	14.8	51.8	14.7	57.7	15.1
12	67.3	15.4	67.2	15.4	73.4	15.7
14	83.2	15.9	83.0	15.8	89.3	15.9
16	99.2	16.0	99.1	16.1	105.4	16.1
18	115.3	16.1*	115.2	16.1*	121.5	16.1*
20	131.5	16.2	.....	.....	.....	.....
		2)32.3		16.1		16.1
		2)16.15		8.05		8.05
		8.075				
		8.050				
		8.050				
		3)24.175				
		8.0583 Velocity with a Motive Weight of 134 lbs.				

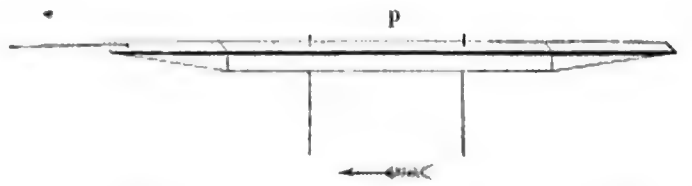
FRIDAY, January 1, 1796.

Parallelopipedon **p** with parallelopipedon **b**, lengthened by the addition of a wedge at each extremity, called **x**, the centre of the lower body being immersed six feet.

System Three-fold.

T. Wt. 511 lbs. 4 oz.			M. Wt. 167 lbs. 8 oz.	
Accel. Wt. 168 lbs.			A. Wt. 168 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.7	5.7	4.8	4.8
4	16.3	10.6	14.5	9.7
6	30.6	10.3	28.0	13.5
8	46.9	16.3	44.2	16.2
10	64.7	17.8	61.5	17.3
12	82.6	17.9	79.4	17.9
14	100.9	18.3*	97.6	18.2*
16	119.1	18.2	115.9	18.3
		2)36.5		36.5
		2)18.25		18.25
		9.125		9.125
		9.125		
		2)18.250		
		9.125	Velocity with a Motive Wt. of 167 lbs. 8 oz.	

Parallelopipedon p with the bars alone, the lower body being taken away.



	Motive Weights.												
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8					
Velocity per Experiment	.....	2.3958	3.3666	4.9916	7.0800	8.8437	10.45	.....					
Hutt. Correction, or Regular Series	1.6386	2.3735	3.4380	4.9802	7.2140	8.9603	10.450	11.774					

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.6627	6.0799	12.981	22.233	33.750	47.466	63.331	81.298	101.34	123.41	147.50	173.57	217.15

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.																			
8	6	and	16	12	2.0376																		
			33	8	1.8886	16	12..	33	8	1.7639													
			67	0	1.9191			67	0	1.8649	33	8..	67	0	1.9832								
			100	8	1.9027			100	8	1.8552			100	8	1.9209	67	0..	100	8	1.8229			
			134	0	1.8824			134	0	1.8359			134	0	1.8763			134	0	1.7804	100	8..	134	1.7237

15)28.0577

Mean 33 lbs. 8 oz. and 134 lbs. 1.8705

Digitized by Google

WEDNESDAY, December 23, 1795.

Parallelopipedon p with the bars alone, the lower body being taken away.

Thermometer in the Air, 48°;—In the Dock, 47°.—Wind, W.S.W. Fresh Breeze.

System Three-fold.

Total Weight 26 lbs. Motive Weight 8 lbs. 6 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 21 lbs.		Accel. Wt. 21 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.2	3.2	3.5	3.5	3.0	3.0
8	8.2	5.0	9.4	5.9	8.6	5.6
12	14.9	6.7	17.2	7.8	16.0	7.4
16	23.3	8.4	26.3	9.1	24.8	8.8
20	32.8	9.5	35.9	9.6	34.2	9.4
24	42.2	9.4	45.6	9.7	43.9	9.6†
28	51.9	9.7	55.2	9.6	53.5	9.6
32	61.4	9.5	64.6	9.4	63.0	9.5
36	70.9	9.5	74.1	9.5	72.4	9.4
40	80.3	9.4	83.5	9.4	81.8	9.4
44	89.8	9.5	93.0	9.5	91.3	9.5
48	99.3	9.5	102.6	9.6	100.9	9.6
52	108.8	9.5	112.7	9.5	110.4	9.5*
56	118.4	9.6*	121.7	9.6*	120.1	9.7
60	127.9	9.5	131.2	9.5	.....	.....
		2)19.1		19.1		19.2
		4)9.55		9.55		9.6
		2.3875		2.3875		2.4
		3.3875				
		2.4000				
		3)7.1750				
		2.3916				

† Query 9.7?

FRIDAY, January 8, 1796.

Parallelopipedon p with the bars alone, the lower body being taken away.

Thermometer in the Air, 45°;—In the Dock 44½°.—Wind, S. S. W. Light Airs.

System Three-fold.

T. Wt. 26 lbs. M. Wt. 8 lbs. 6 oz.				
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.0	3.0	2.9	2.9
8	8.0	5.0	7.3	4.4
12	14.5	6.5	13.4	6.1
16	22.2	7.7	19.8	6.4
20	30.7	8.5	28.1	8.3
24	39.9	9.2	37.2	9.1
28	49.2	9.3	46.6	9.4
32	58.8	9.6	56.4	9.8
36	68.3	9.5	66.0	9.6
40	77.9	9.6	75.6	9.6
44	87.3	9.4	85.2	9.6
48	96.8	9.5	94.8	9.6
52	106.4	9.6	104.5	9.7
56	115.9	9.5*	114.2	9.7*
60	125.6	9.7	123.8	9.6
64	135.1	9.5	.....	.....
		3)28.7		2)19.3
		4)9.5667		9.65
		2.3916		2.4125
		2.4125		
		2.3875		
		2.3875		
		2.4000		
		5)11.9791		
		2.3958 Velocity with a Motive Weight of 8 lbs. 6 oz.		

FRIDAY, January 8, 1796.

Parallelopipedon p with the bars alone, the lower body being taken away.

Thermometer in the Air, 45°;—In the Dock 44½°. —Wind, S. S. W. Light Airs.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.4	5.4	4.3	4.3	4.1	4.1
8	14.1	8.7	11.7	7.4	11.6	7.5
12	25.1	11.0	21.7	10.0	21.8	10.2
16	37.7	12.6	33.6	11.9	33.8	11.0
20	51.2	13.5	46.6	13.0	47.0	13.2
24	64.9	13.7	60.0	13.4	60.7	13.7
28	78.5	13.6	73.4	13.4	74.3	13.6
32	92.0	13.5	86.6	13.2	87.7	13.4
34	98.7	6.7	93.3	6.7	94.4	6.7
36	105.4	6.7	100.0	6.7	101.2	6.8
38	112.2	6.8	106.7	6.7	108.0	6.8
40	118.9	6.7	113.3	6.6	114.7	6.7
42	125.7	6.8*	120.0	6.7	121.5	6.8
44	132.4	6.7	126.7	6.7	128.2	6.7*
46	.....	.....	133.4	6.7	135.0	6.8
48	.....	.....	140.1	6.7*	.....	.....
		2)13.5		6.7		13.5
		2)6.75		3.35		6.75
		3.375				3.375
		3.350				
		3.375				
		3)10.100				
		3.3666 Velocity with a Motive Weight of 16 lbs. 12 oz.				

TUESDAY, December 22, 1795.

Parallelopipedon p with the bars alone, the lower body being taken away.

Thermometer in the Air, 55°;—In the Dock, 47°.—Wind, S. W. Strong Breeze.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.1	2.1	2.1	2.1
4	6.5	4.4	6.4	4.3
6	12.8	6.3	12.7	6.3
8	20.8	8.0	20.7	8.0
10	30.1	9.3	30.0	9.3
12	39.2	9.1	39.3	9.3
14	49.1	9.9	49.0	9.7
16	59.0	9.9	58.9	9.9
18	68.7	9.7	68.9	10.0
20	78.7	10.0	78.9	10.0
22	88.6	9.9	88.9	10.0
24	98.6	10.0	98.9	10.0
26	108.6	10.0*	109.0	10.1*
28	118.8	10.2	119.0	10.0
30	128.8	10.0	129.1	10.1
		3)30.2		30.2
		2)10.066		10.066
		5.0333		5.0333

FRIDAY, January 8, 1796.

Thermometer in the Air, 45°;—In the Dock, 44½°. Wind, S. S. W. Light Airs.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.7	2.7	4.1	4.1
4	7.3	4.6	10.0	5.9
6	13.4	6.1	17.1	7.1
8	20.6	7.2	25.2	8.1
10	28.8	8.2	34.1	8.9
12	37.7	8.9	43.6	9.5
14	47.2	9.5	53.6	10.0
16	57.0	9.8	63.5	9.9
18	66.9	9.9	73.4	9.9
20	76.7	9.8	83.4	10.0
22	86.6	9.9	93.2	9.8
24	96.3	9.7	103.1	9.9*
26	106.1	9.8	.....	.....
28	115.9	9.8	.....	.....
30	125.8	9.9*	.....	.....
		2)9.9		9.9
		4.9500		4.95
		4.9500		
		5.0333		
		5.0333		
		4)19.9666		
		4.9916	Velocity with a M.Wt. of 33 lbs. 8 oz.	

TUESDAY, December 22, 1795.

Parallelopipedon p with the bars alone, the lower body being taken away.

Thermometer in the Air, 55°;—In the Dock 47°.—Wind, S.W. Strong Breeze.

System Three-fold.

Total Weight 207 lbs. Motive Weight 67 lbs.						
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.		Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.4	4.4	2.7	2.7	4.6	4.6
4	12.6	8.2	9.4	6.7	12.9	8.3
6	23.8	11.2	19.4	10.0	24.1	11.2
8	37.3	13.5	31.7	12.3	37.1	13.0
10	50.7	13.4	45.3	13.6	50.9	13.8
12	64.7	14.0	59.0	13.7	64.9	14.0
14	78.7	14.0	73.1	14.1	79.0	14.1
16	92.9	14.2	87.1	14.0	93.2	14.2
18	107.2	14.3	101.5	14.4	107.5	14.3
20	121.5	14.3*	115.8	14.3	121.9	14.4*
22	.....	.....	130.1	14.3*	135.2	14.3
		2)14.3		14.3		28.7
		7.150		7.15		14.35
		7.150				7.175
		7.175				
		3)21.475				
		7.1583				

FRIDAY, January 8, 1796.

Parallelopipedon p with the bars alone, the lower body being taken away.

Thermometer in the Air, 45°;—In the Dock 44½°.
—Wind, S. S. W. Light Airs.

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.0	3.0	2.9	2.9
4	9.8	6.8	10.3	7.4
6	19.8	10.0	20.8	10.5
8	31.9	12.1	33.4	12.6
10	45.4	13.5	47.0	13.6
12	59.2	13.8	60.9	13.9
14	73.1	13.9	74.8	13.9
16	86.9	13.8	88.8	14.0
18	100.8	13.9	102.9	14.1
20	114.6	13.9*	116.8	13.9*
22	128.5	13.9	130.9	14.1
		2)27.7		28.0
		2)13.85		14.0
		6.925		7.0
		7.000		
		7.150		
		7.150		
		7.175		
		5)35.400		
		7.080 Velocity with a Motive Wt. of 67 lbs.		

TUESDAY, December 22, 1795.

Thermometer in the Air, 55°;—In the Dock, 47°.
—Wind, S. W. Strong Breeze.

System Three-fold.

T. W. 307 lbs. 8 oz. M. Wt. 100 lbs. 8 oz.				
Accelerating Wt. 112 lbs.			A. Wt. 112 lb.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.2	4.2	5.6	5.6
4	14.0	9.8	16.7	11.1
6	28.3	14.3	31.7	15.0
8	44.9	16.6	48.6	16.9
10	62.4	17.5	66.3	17.7
12	80.1	17.7	84.1	17.8
14	97.8	17.7*	101.9	17.8*
16	115.6	17.8	119.7	17.8
		2)35.5		35.6
		2)17.75		17.8
		8.875		8.9
		8.900		
		2)17.775		
		8.8875		

SATURDAY, January 9, 1796.

Parallelopipedon p with the bars alone, the lower body being taken away.

Thermometer in the Air, 47°;—In the Dock, 44½°.—
Wind, Light Airs, Easterly.

System Three-fold.

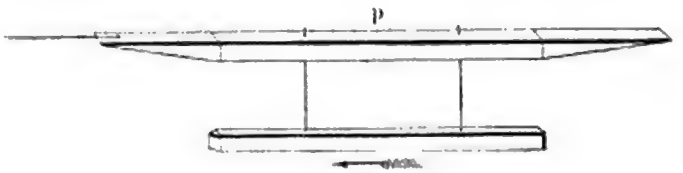
T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accel. Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.1	4.1	6.9	6.9
4	14.0	9.9	18.7	11.8
6	28.0	14.0	34.1	15.4
8	44.6	16.6	51.1	17.0
10	61.8	17.2	68.6	17.5
12	79.2	17.4	86.2	17.6
14	96.8	17.6	103.7	17.5*
16	114.4	17.6*	121.3	17.6
18	132.1	17.7	.....	.....
		2)35.3		35.1
		2)17.65		17.55
		8.825		8.775
		8.775		
		8.875		
		8.900		
		4)35.375		
		8.8437 Velocity with a M. Wt. of 100 lbs. 8 oz.		

System Three-fold.

Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accel. Wt. 112 lbs.			A. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.3	6.3	8.8	8.8
4	23.4	17.1	23.5	14.7
6	41.9	18.5	42.0	18.5
8	62.0	20.1	62.4	20.4
10	82.6	20.6	83.1	20.7
12	103.5	20.9	104.1	21.0
14	124.4	20.9*	125.0	20.9*
		2)20.9		20.9
		10.45		10.45
		10.45		
		2)20.90		
		10.45 Velocity with a Motive Wt. of 134 lbs.		

Parallelopipedon p, with a smooth painted deal plank attached to the bars, its centre being immersed six feet. The foremost end of the deal plank was formed into the shape of an equilateral triangle.

Length 20 feet and $\frac{1}{4}$ of an inch. Depth one foot. Breadth 3 inches. Area of the surface 52.552 feet.



	Motive Weights.							
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment	1.5000	2.1062	3.0625	4.3187	6.1916	7.8083	9.3000	.....
Hutt. Correction, or Regular Series	1.4514	2.0948	3.0238	4.3645	6.2998	7.8083	9.0930	10.234

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	2.0719	7.6736	16.502	28.412	43.304	61.105	81.758	105.21	131.42	160.36	191.99	226.28	283.72
Motive Weights, Short Friction Plank	1.8795	6.9511	14.940	25.708	39.169	55.250	73.902	95.08	118.74	144.86	173.40	204.34	256.16
Friction on 50 feet	0.1924	0.7225	1.562	2.704	4.135	5.855	7.856	10.13	12.68	15.50	18.59	21.94	27.56

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.		lbs. oz.																				
4 3 and	8 6	2.0421																				
	16 12	1.9423	8 6..	16 12	1.8516																	
	33 8	1.9664		33 8	1.9306	16 12..	33 8	2.0165														
	67 0	1.9557		67 0	1.9284		67 0	1.9693	33 8..	67 0	1.9242											
	100 8	1.9264		100 8	1.8965		100 8	1.9144		100 8	1.8558	67..	100 8	1.7477								
	134 0	1.8994		134 0	1.8669		134 0	1.8720		134 0	1.8073		134 0	1.7038	100 8..	134	1.6456					

21)39.6629

Mean 8 lbs. 6 oz. and 100 lbs. 8 oz. 1.8887

TUESDAY, February 9, 1796.

Parallelopipedon p, with a smooth painted deal plank attached to the bars, its centre being immersed six feet. The foremost end of the deal plank was formed into the shape of an equilateral triangle.

Thermometer in the Air, 43°;—In the Dock, 42°.—
Perfectly Calm.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
8	3.1	3.1	2.8	2.8
16	11.0	7.9	9.6	6.8
24	19.2	8.2	18.8	9.2
32	29.8	10.6	29.4	10.6
40	40.9	11.1	40.7	11.3
48	52.4	11.5	52.1	11.4
56	64.0	11.6	63.8	11.7
64	75.8	11.8	75.7	11.9
72	87.6	11.8	87.6	11.9
80	99.6	12.0	99.6	12.0
88	111.5	11.9	111.6	12.0
96	123.5	12.0	123.6	12.0
104	135.5	12.0*	135.6	12.0*
		8)12.0		12.0
		1.5		1.5
		1.5		
		2)3.0		
		1.5 Velocity with a M. Wt. of 4 lbs. 3 oz.		

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 14 lbs.			A. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.8	2.8	3.5	3.5
8	7.5	4.7	9.0	5.5
12	13.7	6.2	15.9	6.9
16	21.1	7.4	23.3	7.4
20	29.4	8.3	31.4	8.1
24	37.9	8.5	39.4	8.0
28	46.6	8.7	47.5	8.1
32	55.1	8.5	55.7	8.2
36	63.6	8.5	63.9	8.2
40	72.1	8.5	72.1	8.2
44	80.4	8.3	80.4	8.3
48	88.8	8.4	88.6	8.2
52	97.2	8.4	97.0	8.4
56	105.6	8.4	105.3	8.3
60	113.9	8.3	113.7	8.4
64	122.4	8.5	122.1	8.4
68	130.9	8.5*	130.5	8.4*
72	139.3	8.4	138.9	8.4
		2)16.9		16.8
		4)8.45		8.4
		2.1125		2.1
		2.1000		
		2)4.2125		
		2.1062 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

Digitized by Google

TUESDAY, February 9, 1796.

Parallelopipedon p, with a smooth painted deal plank attached to the bars, its centre being immersed six feet. The foremost end of the deal plank was formed into the shape of an equilateral triangle.

System Three-fold.

T. Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.				
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.0	5.0	8.4	8.4
8	13.3	8.3	18.2	9.8
12	24.1	10.8	29.6	11.4
16	36.0	11.9	41.8	12.2
20	48.2	12.2	54.0	12.2
24	60.5	12.3	66.3	12.3
28	72.6	12.1	78.4	12.1
32	84.8	12.2	90.6	12.2
34	90.9	6.1	96.7	6.1
36	97.0	6.1	102.9	6.2
38	103.1	6.1	108.9	6.0
40	109.2	6.1	115.0	6.1
42	115.2	6.0	121.2	6.2
44	121.4	6.2	127.3	6.1
46	127.4	6.0*	133.5	6.2*
48	133.6	6.2	139.6	6.1
		2)12.2		12.3
		2)6.1		6.15
		3.050		3.075
		3.075		
		2)6.125		
		3.0625 Velocity with a M. Wt. of 16 lbs. 12 oz.		

System Three-fold.

T. Wt. 102 lbs. 8 oz. M. Wt. 33 lbs. 8 oz.				
Accelerating Wt. 40 lbs.			Accel. Wt. 40 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.5	2.5	5.0	5.0
4	6.6	4.1	11.4	6.4
6	12.4	5.8	18.8	7.4
8	19.4	7.0	26.7	7.9
10	27.2	7.8	34.9	8.2
12	35.4	8.2	43.5	8.6
14	43.7	8.3	52.0	8.5
16	52.4	8.7	60.5	8.5
18	60.9	8.5	69.0	8.5
20	69.6	8.7	77.5	8.5
22	78.1	8.5	86.1	8.6
24	86.7	8.6	94.7	8.6
26	95.3	8.6	103.3	8.6*
28	103.8	8.5	111.9	8.6
30	112.4	8.6*	120.6	8.7
32	121.1	8.7	129.3	8.7
34	129.7	8.6	.....	.....
36	138.3	8.6	.....	.....
		4)34.5		34.6
		2)8.625		8.65
		4.3125		4.325
		4.3250		
		2)8.6375		
		4.3187 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

TUESDAY, February 9, 1796.

Parallelopipedon p, with a smooth painted deal plank attached to the bars, its centre being immersed six feet. The foremost end of the deal plank was formed into the shape of an equilateral triangle.

System Three-fold.

Total Weight 207 lbs. Motive Weight 67lbs.						
Accelerating Wt. 84 lbs.			Accel. Wt. 112 lbs.		Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.1	4.1	5.9	5.9	2.8	2.8
4	11.1	7.0	15.0	9.1	8.9	6.1
6	20.6	9.5	26.6	11.6	18.3	9.4
8	32.2	11.6	38.9	12.3	29.9	11.6
10	44.1	11.9	51.3	12.4	32.0	12.1
12	56.2	12.1	63.7	12.4	54.5	12.5
14	68.3	12.1	75.9	12.2	66.8	12.3
16	80.4	12.1	88.3	12.4	79.1	12.3
18	92.7	12.3	100.7	12.4	91.5	12.4
20	105.0	12.3	113.0	12.3*	103.8	12.3
22	117.4	12.4*	125.4	12.4	116.2	12.4*
24	129.9	12.5	.....	.....	128.5	12.3
		2)24.9		24.7		24.7
		2)12.45		12.35		12.35
		6.225		6.175		6.175
		6.175				
		6.175				
		3)18.575				
		6.1916 Velocity with a M. Wt. of 67 lbs.				

TUESDAY, February 9, 1796.

Parallelopipedon p, with a smooth painted deal plank attached to the bars, its centre being immersed six feet. The foremost end of the deal plank was formed into the shape of an equilateral triangle

System Three-fold.

Total Weight 307 lbs. 8 oz. Motive Weight 100 lbs. 8 oz.						
Accel Wt. 138 lbs.			Accel. Wt. 138 lbs.		Accel. Wt. 138 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.0	8.0	3.1	3.1	6.4	6.4
4	20.0	12.0	11.4	8.3	17.3	10.9
6	34.6	14.6	23.7	12.3	31.6	14.3
8	49.7	15.1	38.4	14.7	47.3	15.7
10	65.0	15.3	53.5	15.1	63.1	15.8
12	80.3	15.3	68.9	15.4	78.8	15.7
14	95.8	15.5	84.2	15.3	94.5	15.7
16	111.4	15.6*	99.7	15.5*	110.2	15.7*
18	127.0	15.6	115.4	15.7	125.8	15.6
		2)31.2		31.2		31.3
		2)15.6		15.6		15.65
		7.800		7.8		7.825
		7.800				
		7.825				
		3)23.425				
		7.8083 Velocity with a Motive Weight of 100 lbs. 8 oz.				

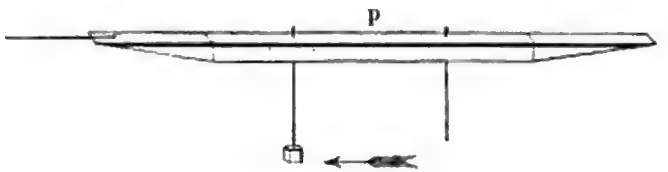
TUESDAY, February 9, 1796.

Parallelopipedon p, with a smooth painted deal plank attached to the bars, its centre being immersed six feet. The foremost end of the deal plank was formed into the shape of an equilateral triangle.

System Three-fold.

T. Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accel. Wt. 194 lbs.			Accel. Wt. 194 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.5	8.5	8.5	8.5
4	22.8	14.3	22.8	14.3
6	40.4	17.6	40.4	17.6
8	59.2	18.8	59.0	18.6
10	77.9	18.7	77.4	18.4
12	96.5	18.6	96.0	18.6
14	115.1	18.6*	114.6	18.6*
		2)18.6		18.6
		9.3		9.3
		9.3		
		2)18.6		
		9.3 Velocity with a Motive Weight of 134 lbs.		

Parallelopipedon p with 1 foot and $\frac{1}{4}$ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away for ascertaining the friction of the water on a surface of 50 feet.



	Motive Weights.									
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8		
Velocity per Experiment.....	1.5750	2.2062	3.1875	4.4500	6.5083	8.2833	9.7375	.....		
Hutt. Correction, or Regular Series	1.5289	2.2076	3.1875	4.6025	6.6454	8.2386	9.5954	.....		

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.8795	6.9511	14.940	25.708	39.169	55.250	73.902	95.079	118.74	144.86	173.40	204.34	256.16

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.		lbs. oz.																					
4 3	and	8 6	2.0568																				
		16 12	1.9664	8 6..	16 12	1.8838																	
		33 8	2.0020		33 8	1.9758	16 12..	33 8	2.0774														
		67 0	1.9541		67 0	1.9222		67 0	1.9420	33 8..	67 0	1.8232											
		100 8	1.9145		100 8	1.8783		100 8	1.8762		100 8	1.7682	67 0..	100 8	1.6814								
		134 0	1.9024		134 0	1.8674		134 0	1.8621		134 0	1.7703		134 0	1.7204	100 8..	134	1.7787					

21)39.6236

Mean 8 lbs. 6 oz. and 16 lbs. 12 oz... 1.8869

THURSDAY, February 11, 1796.

Parallelopipedon p, with 1 foot and ½ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away for ascertaining the friction of the water on a surface of 50 feet.

Thermometer in the Air, 35°;—In the Dock, 41°.
—Perfect Calm.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. 7 lbs.			A. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
8	8.4	8.4	5.0	5.0
16	19.7	11.3	14.2	9.2
24	32.9	13.2	26.0	11.8
32	46.1	13.2	39.0	13.0
40	69.4	13.3	51.9	12.9
48	73.6	14.2	64.8	12.9
56	86.5	12.9	77.5	12.7
60	92.9	6.4	90.2	12.7
64	99.4	6.5	96.5	6.3
68	105.7	6.3	102.9	6.4
72	112.0	6.3	109.1	6.2
76	118.3	6.3	115.5	6.4
80	124.6	6.3	121.8	6.3
84	130.9	6.3	128.1	6.3
88	137.2	6.3*	134.4	6.3*
		4)6.3		6.3
		1.575		1.575
		1.575		
		2)3.150		
		1.575 Velocity with a M. Wt. of 4 lbs. 3 oz.		

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.4	2.4	4.8	4.8
8	7.0	4.6	10.6	5.8
12	13.4	6.4	17.9	7.3
16	21.1	7.7	26.2	8.3
20	29.8	8.7	34.9	8.7
24	38.5	8.7	43.7	8.8
28	47.4	8.9	52.4	8.7
32	56.2	8.8	61.1	8.9
36	64.9	8.7	69.7	8.6
40	73.7	8.8	78.3	8.6
44	82.4	8.7	86.9	8.6
48	91.2	8.8	95.7	8.8
52	100.0	8.8	104.3	8.6
56	108.7	8.7	113.1	8.8
60	117.6	8.9	121.9	8.8
64	126.4	8.8*	130.7	8.8*
68	135.3	8.9	.....	.....
		2)17.7		4)8.8
		4)8.85		2.2
		2.2125		
		2.2000		
		2)4.4125		
		2.2062 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

THURSDAY, February 11, 1796.

Parallelopipedon p with 1 foot and $\frac{1}{4}$ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away for ascertaining the friction of the water on a surface of 50 feet.

System Three-fold.

Total Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accel. Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	8.3	8.3	7.0	7.0
8	19.5	11.2	17.3	10.3
12	32.5	13.0	29.2	11.9
16	45.9	13.4	41.8	12.6
20	59.2	13.3	54.2	12.4
24	72.1	12.9	66.6	12.4
28	84.8	12.7	79.1	12.5
30	91.2	6.4	91.6	12.5
32	97.5	6.3	97.8	6.2
34	103.8	6.3	104.1	6.3
36	110.1	6.3	110.4	6.3
38	116.5	6.4	116.7	6.3
40	122.9	6.4*	123.1	6.4*
42	129.3	6.4	129.4	6.3
		2)12.8		12.7
		2)6.4		6.35
		3.200		3.175
		3.175		
		2)6.375		
		3.1875 Velocity with a Motive Weight of 16 lbs. 12 oz.		

THURSDAY, February 11, 1796.

Parallelopipedon p, with 1 foot and ¾ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away for ascertaining the friction of the water on a surface of 50 feet.

System Three-fold.

Total Weight 102 lbs. 8 oz.			Motive Weight 33 lbs. 8 oz.			
Accelerating Wt. 40 lbs.			Accel. Wt. 40 lbs.		Accel. Wt. 40 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.8	3.8	2.7	2.7	3.6	3.6
4	7.5	3.7	7.4	4.7	9.0	5.4
6	13.8	6.3	13.7	6.3	16.1	7.1
8	21.4	7.6	21.3	7.6	24.1	8.0
10	29.8	8.4	29.7	8.4	32.6	8.5
12	38.4	8.6	38.4	8.7	41.5	8.9
14	47.3	8.9	47.3	8.9	50.5	9.0
16	56.2	8.9	56.1	8.8	59.2	8.7
18	65.1	8.9	65.1	9.0	68.2	9.0
20	73.9	8.8	73.9	8.8	77.1	8.9
22	82.8	8.9	82.8	8.9	86.0	8.9
24	91.6	8.8	91.7	8.9	94.9	8.9
26	100.6	9.0	100.7	9.0	103.9	9.0
28	109.4	8.8	109.5	8.8	112.7	8.8
30	118.3	8.9	118.4	8.9	121.6	8.9
32	127.2	8.9*	127.4	8.9*	130.5	8.9*
		2)8.9		8.9		8.9
		4.45		4.45		4.45
		4.45				
		4.45				
		3)13.35				
		4.45	Velocity with a Motive Weight of 33 lbs 8 oz.			

THURSDAY, February 11, 1796.

Parallelopipedon p with 1 foot and ÷ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away for ascertaining the friction of the water on a surface of 50 feet.

System Three-fold.

Total Wt. 207 lbs.			Motive Wt. 67 lbs.	
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.8	6.8	5.6	5.6
4	16.8	10.0	14.7	9.1
6	29.5	12.7	26.4	11.7
8	42.8	13.3	39.5	13.1
10	56.0	13.2	52.7	13.2
12	69.2	13.2	65.7	13.0
14	82.2	13.0	78.5	12.8
16	95.2	13.0*	91.6	13.1
18	108.2	13.0	104.6	13.0*
20	121.3	13.1	117.5	12.9
22	.....	.....	130.6	13.1
		3)39.1		39.0
		2)13.033		13.0
		6.5166		6.5
		6.5000		
		2)13.0166		
		6.5083	Velocity with a M. Wt. of 67 lbs.	

THURSDAY, February 11, 1796.

Parallelopipedon p with 1 foot and $\frac{1}{4}$ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away for ascertaining the friction of the water on a surface of 50 feet.

System Three-fold.

Total Weight 307 lbs. 8 oz. Motive Weight 100 lbs. 8 oz.						
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.		Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.8	6.8	5.9	5.9	7.6	7.6
4	17.9	11.1	16.8	10.9	19.7	12.1
6	32.4	14.5	30.9	14.1	34.2	14.5
8	48.8	16.4	46.8	15.9	50.4	16.2
10	65.7	16.9	63.1	16.3	66.7	16.3
12	82.4	16.7	79.3	16.2	83.1	16.4
14	99.1	16.7	95.8	16.5	99.6	16.5
16	115.8	16.7*	112.3	16.5	116.1	16.5*
18	.....	.....	128.8	16.5*	.....	.....
		2)16.7		16.5		16.5
		8.35		8.25		8.25
		8.25				
		8.25				
		3)24.85				
		8.2833 Velocity with a Motive Weight of 100 lbs. 8 oz.				

THURSDAY, February 11, 1796.

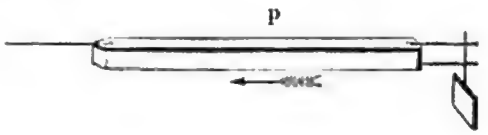
Parallelopipedon p with 1 foot and ¼ of an inch of the fore part of the plank fixed to the foremost bar, the remaining part (20 feet) being taken away for ascertaining the friction of the water on a surface of 50 feet.

System Three-fold.

T. Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accel. Wt. 138 lbs.			Accel. Wt. 138 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.9	8.9	9.2	9.2
4	23.5	14.6	24.1	14.9
6	41.8	18.3	42.4	18.3
8	61.2	19.4	61.3	18.9
10	80.7	19.5	80.5	19.2
12	100.2	19.5*	100.0	19.5*
14	119.7	19.5	119.4	19.4
		2)39.0		38.9
		2)19.5		19.45
		9.750		9.725
		9.725		
		2)19.475		
		9.7375 Velocity with a Motive Wt. of 134 lbs.		

EXPERIMENTS MADE TO ASCERTAIN THE RESISTANCE OF WATER AT DIFFERENT DEPTHS.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed three feet. Angle of incidence 30°.



	Motive Weights.												
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8					
Velocity per Experiment	....	1.4500	1.9923	2.800	3.925	4.8500	5.5375	.....					
Hutt. Correction, or Regular Series	1.0181	1.4266	1.9990	2.8010	3.9250	4.7813	5.4999	6.1308					

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	4.0361	16.769	38.571	69.655	110.17	160.23	219.94	289.37	368.61	457.67	556.71	665.68	851.43
Conductor and Bar	0.7781	3.550	8.626	16.197	26.40	39.36	55.16	73.90	95.64	120.46	148.41	179.56	233.42
Resistance of Plane	3.2580	13.219	29.945	53.458	83.77	120.87	164.78	215.47	272.97	337.21	408.30	486.12	618.01

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.														
8 6 and	16 12	2.1815													
	33 8	2.1067	16 12..	33 8	2.0367										
	67 0	2.0882		67 0	2.0445	33 8..	67 0	2.0523							
	100 8	2.0581		100 8	2.0139		100 8	1.9999	67 0..	100 8	1.9161				
	134 0	2.0691		134 0	2.0342		134 0	2.0330		134 0	2.0140	100 8..	134	2.1701	

15)30.8183

Mean 33 lbs. 8 oz. and 67 lbs.. . 2.0546

THURSDAY, October 1, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed three feet.

Thermometer in the Air, 66½°;—In the Dock, 64°.
—Wind, E. S. E. Light Breeze.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.9	2.9	3.7	3.7
8	6.5	3.6	7.7	4.0
12	10.6	4.1	12.1	4.4
16	15.1	4.5	16.8	4.7
20	19.7	4.6	21.6	4.8
24	24.4	4.7	26.6	5.0
28	29.4	5.0	31.6	5.0
32	34.5	5.1	36.7	5.1
36	39.7	5.2	41.9	5.2
40	44.9	5.2	47.0	5.1
44	50.1	5.2	52.2	5.2
48	55.4	5.3	57.5	5.3
52	60.6	5.2	62.8	5.3
56	65.9	5.3	68.2	5.4
60	71.4	5.5	73.6	5.4
64	76.9	5.5	79.0	5.4
68	82.5	5.6	84.5	5.5
72	88.1	5.6	90.1	5.6
80	93.7	5.6	95.6	5.5
84	99.4	5.7	101.3	5.7
88	105.1	5.7	106.9	5.6
92	110.8	5.7	112.6	5.7
96	116.6	5.8	118.4	5.8*
100	122.4	5.8	.....	.....
104	128.2	5.8*	.....	.....

4)5.8 — 5.8

1.45 — 1.45

1.45

2)2.90

1.45 Velocity with a M. Wt. of 8 lbs. 6 oz.

System Three-fold.

T. Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.6	3.6	3.0	3.0
8	9.0	5.4	8.0	5.0
12	15.4	6.4	14.0	6.0
16	22.2	6.8	20.5	6.5
20	29.3	7.1	27.2	6.7
24	36.5	7.2	34.2	7.0
28	43.8	7.3	41.5	7.3
32	51.3	7.5	48.9	7.4
36	58.9	7.6	56.6	7.7
40	66.4	7.5	64.3	7.7
44	74.1	7.7	72.1	7.8
48	81.9	7.8	79.8	7.7
52	89.6	7.7	87.6	7.8
56	97.3	7.7	95.4	7.8
58	101.2	3.9	103.1	7.7
60	105.1	3.9	107.1	4.0
62	108.9	3.8	110.9	3.8
64	112.8	3.9	114.8	3.9
66	116.6	3.8	118.7	3.9*
68	120.5	3.9	122.6	3.9
70	124.4	3.9	126.6	4.0
72	128.3	3.9	130.6	4.0
74	132.2	3.9	134.5	3.9
76	136.1	3.9	.....	.....
78	140.0	3.9*	.....	.....

2)3.9 — 5)19.7

1.95 — 2)3.94

1.97 — 1.97

2)3.92

1.96

TUESDAY, October 13, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed three feet.

Thermometer in the Air, 61°;—In the Dock, 62°.—Wind, S. W. Blowing Fresh.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.3	4.3	5.2	5.2	5.1	5.1
8	10.3	6.0	11.7	6.5	10.8	5.7
12	17.0	6.7	18.9	7.2	17.4	6.6
16	23.9	6.9	26.5	7.6	24.1	6.7
20	31.4	7.5	34.2	7.7	31.3	7.2
24	38.9	7.5	41.9	7.7	38.8	7.5
28	46.7	7.8	49.6	7.7	46.5	7.7
32	54.6	7.9	57.5	7.9	54.4	7.9
36	62.6	8.0	65.3	7.8	62.3	7.9
40	70.6	8.0	73.2	7.9	70.3	8.0
44	78.4	7.8	80.9	7.7	78.1	7.8
48	86.3	7.9	88.8	7.9	86.0	7.9
52	94.2	7.9	96.7	7.9	93.9	7.9
56	102.3	8.1	100.6	3.9	106.2	12.3
58	106.3	4.0	104.6	4.0	110.2	4.0
60	110.2	3.9	108.5	3.9	114.1	3.9*
62	114.3	4.1*	112.6	4.1*	118.1	4.0
64	118.2	3.9	116.6	4.0	122.1	4.0
66	122.3	4.1	120.6	4.0	126.2	4.1
68	126.4	4.1	.....	.....	.....	.....
		4)16.2		3)12.1		4)16.0
		2)4.05		4.033		4.0
		2.0250		2.0166		2.0
		2.0166				
		2.0000				
		1.9500				
		1.9700				
		5)9.9616				
		1.9923 Velocity with a M. Wt. of 16 lbs. 12 oz.				

THURSDAY, October 1, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed three feet.

Thermometer in the Air, 66½°;—In the Dock, 64½°.
—Wind, E. S. E. Light Breeze.

System Three-fold.

Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.7	7.7	8.2	8.2
8	17.1	9.4	15.1	6.9
12	27.0	9.9	24.9	9.8
16	37.4	10.4	35.3	10.4
20	48.2	10.8	45.8	10.5
24	59.3	11.1	56.8	11.0
28	70.6	11.3	67.7	10.9
32	81.8	11.2	78.8	11.1
36	92.9	11.1	89.9	11.1
40	104.1	11.2	101.0	11.1
42	109.7	5.6	106.5	5.5
44	115.3	5.6*	112.0	5.5
46	121.1	5.8	117.5	5.5*
48	126.7	5.6	123.1	5.6
50	132.4	5.7	128.6	5.5
52	138.0	5.6	134.1	5.5
54	.....	.....	139.7	5.6
		5)28.3		27.7
		2)5.66		5.54
		2.83		2.77
		2.77		
		2)5.60		
		2.80 Velocity with a M. Wt. of 33 lbs. 8 oz.		

System Three-fold.

Total Wt. 204 lbs.			Motive Wt. 67 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.0	4.0	3.9	3.9
4	9.6	5.6	9.5	5.6
6	16.3	6.7	16.1	6.6
8	23.4	7.1	23.1	7.0
10	30.7	7.3	30.5	7.4
12	38.2	7.5	37.9	7.4
14	45.7	7.5	45.2	7.3
16	53.5	7.8	52.6	7.4
18	61.2	7.7	60.2	7.6
20	68.9	7.7	67.8	7.6
22	76.7	7.8	75.5	7.7
24	84.5	7.8	83.2	7.7
26	92.4	7.9	90.8	7.6
28	100.3	7.9	98.6	7.8
30	108.0	7.7*	106.4	7.8*
32	115.8	7.8	114.2	7.8
34	123.7	7.9	122.1	7.9
36	131.7	8.0	130.0	7.9
38	139.6	7.9	137.8	7.8
		5)39.3		39.2
		2)7.86		7.84
		3.93		3.92
		3.92		
		2)7.85		
		3.925 Velocity with a Motive Wt. of 67 lbs.		

THURSDAY, October 1, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed three feet.

System Three-fold.

T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.2	6.2	5.6	5.6
4	14.3	8.1	13.6	8.0
6	23.2	8.9	22.2	8.6
8	32.4	9.2	31.4	9.2
10	41.6	9.2	40.6	9.2
12	50.9	9.3	49.8	9.2
14	60.4	9.5	59.0	9.2
16	69.8	9.4	68.4	9.4
18	79.5	9.7	77.8	9.4
20	89.2	9.7	87.4	9.6
22	99.1	9.9	97.2	9.8*
24	108.9	9.8*	106.8	9.6
26	118.7	9.8	116.4	9.6
28	128.4	9.7	126.1	9.7
30	138.0	9.6	.....	.....
		4)38.9		38.7
		2)9.725		9.675
		4.8625		4.8375
		4.8375		
		2)9.7000		
		4.8500	Velocity with a Motive Weight of 100 lbs. 8 oz.	

THURSDAY, October 1, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed three feet.

System Three-fold.

Total Weight 409 lbs. 8 oz. Motive Weight 134 lbs.						
Accel. Wt. none.			A. Wt. none.		A. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.3	8.3	8.6	8.6	7.1	7.1
4	18.3	10.0	18.7	10.1	16.6	9.5
6	28.8	10.5	29.2	10.5	26.8	10.2
8	39.5	10.7	39.8	10.6	37.4	10.6
10	50.2	10.7	50.5	10.7	48.1	10.7
12	61.1	10.9	61.4	10.9	58.8	10.7
14	72.1	11.0	72.6	11.2	69.8	11.0
16	83.1	11.0	83.7	11.1	80.8	11.0
18	94.3	11.2*	94.8	11.1*	91.8	11.0*
20	105.4	11.1	105.9	11.1	102.8	11.0
22	116.6	11.2	.....	.....	113.8	11.0
24	127.6	11.0	.....	.....	124.8	11.0
26	.....	.....	.....	.....	135.8	11.0
		4)44.5		2)22.2		5)55.0
		2)11.125		11.1		11.0
		5.5625		5.55		5.5
		5.5500				
		5.5000				
		3)16.6125				
		5.5375 Velocity with a Motive Wt. of 134 lbs.				

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

	Motive Weights.									
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8		
Velocity per Experiment	.....	.....	1.9000	2.6666	3.7000	4.5500	5.2441	.....		
Hutt. Correction, or Regular Series	0.9632	1.3525	1.8992	2.6666	3.7442	4.5665	5.2573	5.8643		

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	4.5199	18.617	42.613	76.683	120.95	175.51	240.45	315.83	401.71	498.16	605.19	722.90	923.22
Conductor and Bar	1.1939	5.142	12.078	22.138	35.42	52.01	71.96	95.33	122.18	152.54	186.45	223.96	288.27
Resistance of Plane	3.3260	13.475	30.535	54.545	85.53	123.50	168.49	220.50	279.53	345.62	418.74	498.94	634.95
Reduced to one foot	1.1192	4.534	10.275	18.354	28.78	41.56	56.70	74.20	94.06	116.30	140.91	167.89	213.66

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.												
16 12 and	33 8	2.0450											
	67 0	2.0800	33 8..	67 0	2.1163								
	100 8	2.0517		100 8	2.0561	67 0..	100 8	1.9607					
	134 0	2.0482		134 0	2.0499		134 0	1.9874	100 8..	134	2.0263		

10)20.4216

Mean 16 lbs. 12 oz. and 33 lbs. 8 oz... 2.0422

WEDNESDAY, October 7, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

Thermometer in the Air, 66°;—In the Dock, 61°.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.3	4.3	5.1	5.1
8	10.1	5.8	11.3	6.2
12	16.7	6.6	18.0	6.7
16	23.9	7.2	24.7	6.7
20	31.2	7.3	31.8	7.1
24	38.4	7.2	38.9	7.1
28	45.6	7.2	46.2	7.3
32	52.9	7.3	53.6	7.4
36	60.4	7.5	61.0	7.4
40	67.8	7.4	68.6	7.6
44	75.4	7.6	76.2	7.6
48	83.0	7.6	84.0	7.8
52	90.6	7.6	87.8	3.8
56	98.3	7.7	91.8	4.0
58	102.2	3.9	95.6	3.8
60	106.0	3.8*	99.5	3.9
62	109.9	3.9	103.3	3.8*
64	113.7	3.8	107.2	3.9
66	117.5	3.8	111.1	3.9
68	.....	.....	117.9	3.8
		4)15.3		15.4
		2)3.825		3.85
		1.9125		1.925

FRIDAY, October 16, 1795.

Thermometer in the Air, 60½°;—In the Dock, 57°.—Wind, S. W. Strong Breeze.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.7	3.7	4.3	4.3
8	9.3	5.6	10.2	5.9
12	15.8	6.5	16.6	6.4
16	22.8	7.0	23.6	7.0
20	29.8	7.0	30.8	7.2
24	36.9	7.1	38.0	7.2
28	44.1	7.2	45.3	7.3
32	51.4	7.3	52.7	7.4
36	58.7	7.3	60.2	7.5
40	66.0	7.3	67.7	7.5
44	73.4	7.4	75.0	7.3
48	80.8	7.4	82.4	7.4
52	88.2	7.4	86.0	3.6
54	92.0	3.8	89.6	3.6
56	95.7	3.7	93.3	3.7
58	99.5	3.8	97.1	3.8
60	103.2	3.7	100.9	3.8
62	106.7	3.5	104.7	3.8
64	110.6	3.9	108.5	3.8*
66	114.4	3.8*		2)3.8
68	118.1	3.7		1.9000
70	121.8	3 7		1.8625
72	125.5	3.7		1.9125
		4)14.9		1.9250
		2)3.725		4)7.6000
		1.8625		1.9000 †

† Velocity with a Motive Weight of 16 lbs. 12 oz.

FRIDAY, October 16, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

System Three-fold.

T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.8	2.8	3.5	3.5
4	6.6	3.8	7.6	4.1
6	10.9	4.3	12.2	4.6
8	15.6	4.7	17.0	4.8
10	21.4	5.8	21.9	4.9
12	25.3	3.9	27.0	5.1
14	30.4	5.1	32.1	5.1
16	35.6	5.2	37.3	5.2
18	40.8	5.2	42.6	5.3
20	46.1	5.3	47.9	5.3
22	51.4	5.3	53.3	5.4
24	56.7	5.3	58.6	5.3
26	62.0	5.3	63.5	4.9
28	67.3	5.3	69.1	5.6
30	72.8	5.5	74.6	5.5
32	78.1	5.3	80.1	5.5
34	83.5	5.4	85.6	5.5
36	88.8	5.3	91.0	5.4*
38	94.0	5.2*	96.4	5.4
40	99.5	5.5	101.8	5.4
42	104.8	5.3	107.1	5.3
44	110.1	5.3	112.5	5.4
46	115.3	5.2	117.8	5.3
48	120.6	5.3	.....	.....
		6)31.8		32.2
		2)5.3		5.3666
		2.6500		2.6833
		2.6833		
		2)5.3333		
		2.6666	Velocity with a Motive Wt. of 33 lbs. 8 oz.	

WEDNESDAY, October 7, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

Thermometer in the Air, 66°;—In the Dock, 61°.

System Three-fold.

Total Weight 205 lbs. Motive Weight 67 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.3	4.3	5.4	5.4	5.1	5.1
4	10.2	5.9	12.0	6.6	11.4	6.3
6	16.7	6.5	18.6	6.6	18.0	6.6
8	23.7	7.0	25.5	6.9	24.9	6.9
10	30.7	7.0	32.4	6.9	31.8	6.9
12	37.7	7.0	39.5	7.1	38.7	6.9
14	44.9	7.2	46.7	7.2	45.8	7.1
16	52.2	7.3	53.7	7.0	52.9	7.1
18	59.5	7.3	61.0	7.3	60.2	7.3
20	66.6	7.1	68.2	7.2	67.3	7.1
22	74.2	7.6	75.8	7.6	74.7	7.4
24	81.6	7.4	83.3	7.5	82.1	7.4*
26	88.9	7.3	90.8	7.5*	89.4	7.3
28	96.3	7.4*	98.2	7.4	96.8	7.4
30	103.8	7.5	105.5	7.3	104.1	7.3
32	111.1	7.3	112.8	7.3	111.6	7.5
34	118.4	7.3	120.1	7.3	.....	.....
36	125.8	7.4	.....	.....	.....	.....
		5)36.9		36.8		36.9
		2)7.38		7.36		7.38
		3.69		3.68		3.69
		3.68				
		3.69				
		3)11.06				
		3.6866				

Digitized by Google

FRIDAY, October 16, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

Thermometer in the Air, 60½°;—In the Dock, 57°.—Wind, S.W. Strong Breeze.

System Three-fold.

Total Weight 209 lbs. Motive Weight 67 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.1	5.1	4.6	4.6	5.4	5.4
4	11.3	6.2	10.7	6.1	11.6	6.2
6	17.9	6.6	16.9	6.2	18.4	6.8
8	24.6	6.7	23.6	6.7	25.3	6.9
10	31.7	7.1	30.7	7.1	32.4	7.1
12	38.9	7.2	37.9	7.2	39.6	7.2
14	46.2	7.3	45.3	7.4	47.0	7.4
16	53.5	7.3	52.7	7.4	54.4	7.4
18	60.9	7.4	60.0	7.3	61.8	7.4
20	68.2	7.3	67.3	7.3	69.3	7.5
22	75.6	7.4	74.6	7.3	76.7	7.4*
24	83.0	7.4*	82.0	7.4*	84.2	7.5
26	90.4	7.4	89.3	7.3	91.8	7.6
28	97.7	7.3	96.8	7.5	99.4	7.6
30	105.1	7.4	104.1	7.3	107.0	7.6
32	112.4	7.3	111.5	7.4	.....	.....
		5)36.8		36.9		37.7
		2)7.36		7.38		7.54
		3.68		3.69		3.77
		3.69				
		3.77				
		3.69				
		3.68				
		3.69				
		6)22.20				
		3.70 Velocity with a Motive Wt. of 67 lbs.				

These experiments being made with a new rope, it was necessary to increase the total weight four pounds.

WEDNESDAY, October 7, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

Thermometer in the Air, 60°;—In the Dock, 61°.

System Thee-fold

T. Wt. 308 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.0	6.0	6.2	6.2
4	13.6	7.6	14.2	8.0
6	21.9	8.3	22.7	8.5
8	30.5	8.6	31.6	8.9
10	39.3	8.8	40.4	8.8
12	48.5	9.2	49.4	9.0
14	57.4	8.9	58.3	8.9
16	66.4	9.0	67.5	9.2
18	75.5	9.1	76.5	9.0
20	84.7	9.2*	85.7	9.2*
22	93.9	9.2	94.8	9.1
24	103.1	9.2	104.0	9.2
26	112.3	9.2	113.1	9.1
		4)36.8		36.6
		2)9.2		9.15
		4.600		4.575
		4.575		
		2)9.175		
		4.5875		

FRIDAY, October 16, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

Thermometer in the Air, 60½°;—In the Dock 57°.—Wind, S.W. Strong Breeze.

System Three-fold.

Total Weight 308 lbs. 8 oz. Motive Weight 100 lbs. 8 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.0	6.0	5.2	5.2	5.2	5.2
4	13.6	7.6	12.3	7.1	12.2	7.0
6	21.9	8.3	20.5	8.2	20.4	8.2
8	30.5	8.6	29.1	8.6	28.8	8.4
10	39.3	8.8	38.0	8.9	37.7	8.9
12	48.2	8.9	46.9	8.9	46.6	8.9
14	57.1	8.9	55.9	9.0	55.6	9.0
16	66.2	9.1	64.9	9.0	64.6	9.0
18	75.2	9.0	73.9	9.0	73.6	9.0
20	84.2	9.0*	82.9	9.0*	82.6	9.0*
22	93.0	8.8	92.0	9.1	91.6	9.0
24	102.0	9.0	101.2	9.2	100.8	9.2
26	111.0	9.0	110.4	9.2	109.9	9.1
		4)35.8		36.5		36.3
		2)8.95		9.125		9.075
		4.4750		4.5625		4.5375
		4.5625				
		4.5375				
		4.6000				
		4.5750				
		5)22.7500				
		4.5500 Velocity with a Motive Weight of 100 lbs. 8 oz.				

WEDNESDAY, October 7, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

Thermometer in the Air, 60°;—In the Dock, 61°.

System Three-fold.

Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.						
Accel. Wt. none.			A. Wt. none.		A. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.4	8.4	8.2	8.2	7.3	7.3
4	17.6	9.2	17.6	9.4	16.6	9.3
6	27.8	10.2	27.7	10.1	26.8	10.2
8	38.0	10.2	37.6	9.9	37.0	10.2
10	48.2	10.2	47.8	10.2	47.1	10.1
12	58.4	10.2	58.1	10.3	57.2	10.1
14	68.9	10.5	68.6	10.5	67.5	10.3
16	79.4	10.5	79.0	10.4*	77.7	10.2
18	89.9	10.5	89.5	10.5	88.1	10.4*
20	100.4	10.5*	100.0	10.5	98.5	10.4
22	.....	.....	110.6	10.6	109.1	10.6
24	.....	.....	.....	.....	119.6	10.5
		2)10.5		4)42.0		41.9
		5.2500		2)10.5		10.475
		5.2500				
		5.2375		5.25		5.2375
		3)15.7375				
		5.2458				

FRIDAY, October 16, 1795.

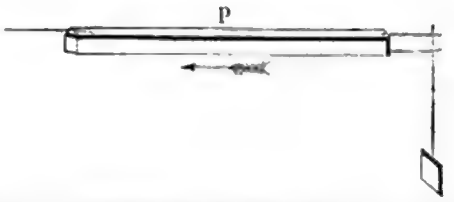
Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed six feet.

Thermometer in the Air, 60½°;—In the Dock 57°,—Wind, S.W. Strong Breeze.

System Three-fold.

T. Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accel. Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.2	7.2	7.2	7.2
4	16.2	9.0	16.4	9.2
6	25.8	9.6	25.8	9.4
8	36.0	10.2	35.8	10.0
10	46.3	10.3	46.2	10.4
12	57.0	10.7	56.5	10.3
14	67.3	10.3	67.1	10.6
16	77.7	10.4	77.7	10.6
18	88.0	10.3*	88.2	10.5*
20	98.4	10.4	98.8	10.6
22	108.8	10.4	109.5	10.7
		3)31.1		31.8
		2)10.366		10.6
		5.1833		5.3
		5.3000		
		5.2500		
		5.2500		
		5.2375		
		5)26.2208		
		5.2441 Velocity with a Motive Weight of 134 lbs.		

Parallelopipédon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.



	Motive Weights.							
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment	.....	1.2397	1.7724	2.5535*	3.5396	4.3171	4.9687	.....
Hutt. Correction, or Regular Series	0.8901	1.2560	1.7724	2.5012	3.5294	4.3171	4.9804	5.5643

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	5.2935	21.359	48.308	86.195	135.06	194.94	265.86	347.84	440.88	545.04	660.29	786.68	1001.09
Conductor and Bar.....	1.7010	7.045	16.178	29.178	46.10	67.00	91.90	120.84	153.85	190.95	232.15	277.49	354.73
Resistance of Plane	3.5925	14.314	32.130	57.017	88.96	127.94	173.96	227.00	287.03	354.09	428.14	509.19	646.36

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.												
8 6 and	16 12	1.9391											
	33 8	1.9185	16 12..	33 8	1.8984								
	67 0	1.9820		67 0	2.0043	33 8..	67 0	2.1226					
	100 8	1.9916		100 8	2.0126		100 8	2.0921	67 0..	100 8	2.0419		
	134 0	1.9971		134 0	2.0173		134 0	2.0824		134 0	2.0438	100 8..	134 | 2.0465

15)30.1902

Mean 16 lbs. 12 oz. and 100 lbs. 8 oz. 2.0127

* Query 2.5543?

THURSDAY, October 29, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.2	2.2	3.0	3.0
8	5.3	3.1	6.5	3.5
12	9.1	3.8	10.5	4.0
16	13.2	4.1	14.6	4.1
20	17.4	4.2	19.0	4.4
24	21.8	4.4	23.5	4.5
28	26.3	4.5	27.9	4.4
32	30.8	4.5	32.6	4.7
36	35.5	4.7	37.3	4.7
40	40.2	4.7	42.0	4.7
44	45.0	4.8	46.7	4.7
48	49.8	4.8	51.5	4.8
52	54.6	4.8	56.3	4.8
56	59.5	4.9	61.2	4.8
60	64.4	4.9	65.9	4.7
64	69.2	4.8	70.7	4.8
68	74.1	4.9	75.4	4.7
72	78.9	4.8	80.4	5.0
76	83.8	4.9	85.2	4.8
80	88.6	4.8	90.1	4.9*
84	93.6	5.0*	94.9	4.8
88	98.6	5.0	99.9	5.0
92	103.6	5.0	104.9	5.0
96	108.5	4.9	109.9	5.0
100	113.6	5.1	.....	.....
104	118.5	4.9	.....	.....
108	123.5	5.0	.....	.....
112	128.4	4.9	.....	.....
116	133.4	5.0	.....	.....
		9)44.8		5)24.7
		4)4.9777		4.94
		1.2444		1.235
		1.2350		
		2)2.4794		
		1.2397	Velocity with a Motive Wt. of 8 lbs. 6 oz.	

WEDNESDAY, October 14, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 66°;—In the Dock, 59°.—Wind, S. W. Light Breeze.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.7	4.7	4.0	4.0
8	10.6	5.9	9.5	5.5
12	17.1	6.5	15.8	6.3
16	23.7	6.6	22.4	6.6
20	30.6	6.9	29.1	6.7
24	37.6	7.0	36.0	6.9
28	44.5	6.9	42.9	6.9
32	51.6	7.1	49.9	7.0
36	58.7	7.1	56.8	6.9
40	65.9	7.2	63.8	7.0
44	72.9	7.0	71.0	7.2
48	80.0	7.1	78.2	7.2
52	87.1	7.1	85.5	7.3
56	94.4	7.3	92.7	7.2
58	98.0	3.6	96.3	3.6
60	101.7	3.7*	100.0	3.7
62	105.4	3.7	103.5	3.5*
64	109.0	3.6	107.1	3.6
66	112.6	3.6	110.8	3.7
68	116.3	3.7	114.4	3.6
70	120.0	3.7	118.1	3.7
72	.....	.....	121.8	3.7
		6)22.0		21.8
		2)3.666		3.6333
		1.8333		1.8166
		1.8166		
		2)3.6499		
		1.8249		

THURSDAY, October 29, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.6	4.6	3.4	3.4	4.1	4.1
8	10.2	5.6	8.6	5.2	9.5	5.4
12	16.3	6.1	14.5	5.9	15.5	6.9
16	22.6	6.3	20.9	6.4	21.9	6.4
20	29.2	6.6	27.5	6.6	28.5	6.6
24	35.8	6.6	34.1	6.6	35.1	6.6
28	42.6	6.8	40.9	6.8	41.7	6.6
32	49.6	7.0	47.6	6.7	48.5	6.8
36	56.5	6.9	54.5	6.9	55.3	6.8
40	63.4	6.9	61.2	6.7	62.2	6.9
44	70.5	7.1	67.9	6.7	69.1	6.9
48	77.4	6.9	74.7	6.8	75.9	6.8
52	84.6	7.2	81.6	6.9	82.8	6.9
56	91.7	7.1	88.6	7.0	89.7	6.9
60	98.8	7.1	95.6	7.0	96.6	6.9
64	105.9	7.1	102.7	7.1	100.2	3.6
66	109.4	3.5*	106.1	3.4	103.6	3.4
68	112.9	3.5	109.6	3.5	107.1	3.5
70	116.5	3.6	113.1	3.5*	110.5	3.4
72	120.1	3.6	116.5	3.4	114.0	3.5*
74	123.6	3.5	120.0	3.5	117.5	3.5
76	127.2	3.6	123.5	3.5	121.0	3.5
78	130.7	3.5	126.9	3.4	124.4	3.4
80	134.2	3.5	130.4	3.5	127.7	3.3
82	137.8	3.6	133.9	3.5	131.2	3.5
84	.....	.....	137.4	3.5	134.6	3.4
86	.....	.....	140.9	3.5	138.1	3.5
88	.....	.....	.....	.....	141.6	3.5
		9)31.9		31.3		31.1
		2)3.5444		3.4777		3.4555
		1.7722		1.7388		1.7277
		1.7388				
		1.7277				
		3)5.2387				
		1.7462				

Digitized by Google

FRIDAY, November 13, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 52½°;—In the Dock, 47½°.—Wind, West, Moderate.

System Three-fold.

Total Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.5	3.5	3.3	3.3
8	8.6	5.1	8.3	5.0
12	14.3	5.7	14.2	5.9
16	20.6	6.3	20.6	6.4
20	27.0	6.4	27.1	6.5
24	33.6	6.6	33.8	6.7
28	40.3	6.7	40.7	6.9
32	47.1	6.8	47.7	7.0
36	54.0	6.9	54.8	7.1
40	60.8	6.8	61.9	7.1
44	67.6	6.8	69.1	7.2
48	74.4	6.8	76.2	7.1
52	81.4	7.0	83.5	7.3
56	88.2	6.8	90.6	7.1
60	94.6	6.4	97.6	7.0
64	102.4	7.8	101.2	3.5
66	105.9	3.5	104.7	3.5
68	109.4	3.5	108.2	3.5
70	112.9	3.5	111.7	3.5
72	116.5	3.6	115.2	3.5
74	120.0	3.5*	118.7	3.5*
76	123.5	3.5	122.3	3.6
78	127.0	3.5	125.8	3.5
80	130.5	3.5	129.3	3.5
82	134.1	3.6	132.8	3.5
84	.....	.....	136.3	3.5

5)17.6 — 6)21.1

2)3.52 — 3.5166

1.7600
1.7583
1.7277
1.7388
1.7722
1.8166
1.8333

7)12.4069

1.7724 Velocity with a Motive Wt. of 16 lbs. 12 oz.

1.7583

WEDNESDAY, October 14, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 66°;—In the Dock 59°.—Wind, S.W. Light Breeze.

System Three-fold.

Total Weight 102 lbs. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.8	2.8	2.6	2.6	2.7	2.7
4	6.4	3.6	5.9	3.3	6.3	3.6
6	10.6	4.2	9.8	3.9	10.4	4.1
8	14.8	4.2	14.2	4.4	14.9	4.5
10	19.3	4.5	18.8	4.6	19.6	4.7
12	23.8	4.5	23.4	4.6	24.3	4.7
14	28.5	4.7	28.2	4.8	29.0	4.7
16	33.2	4.7	33.2	5.0	34.0	5.0
18	38.0	4.8	38.1	4.9	38.9	4.9
20	42.9	4.9	43.1	5.0	43.8	4.9
22	47.8	4.9	48.3	5.2	48.8	5.0
24	52.7	4.9	53.4	5.1	53.8	5.0
26	57.8	5.1	58.4	5.0	58.8	5.0
28	62.8	5.0	63.5	5.1	63.8	5.0
30	67.9	5.1	68.6	5.1	68.8	5.0
32	73.0	5.1	73.6	5.0	73.9	5.1
34	78.1	5.1	78.8	5.2	79.0	5.1
36	83.3	5.2	83.9	5.1	84.1	5.1
38	88.4	5.1*	89.0	5.1*	89.1	5.0*
40	93.6	5.2	94.1	5.1	94.2	5.1
42	98.8	5.2	99.3	5.2	99.4	5.2
44	104.1	5.3	104.4	5.1	104.7	5.3
46	109.2	5.1	109.5	5.1	109.9	5.2
48	114.4	5.2	114.7	5.2	115.2	5.3
		6)31.1		30.8		31.1
		2)5.1833		5.1333		5.1833
		2.5916		2.5666		2.5916
		2.5666				
		2.5916				
		3)7.7498				
		2.5832				

THURSDAY, October 29, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

System Three-fold.

Total Weight 102 lbs. 8 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.2	6.2	6.6	6.6	5.7	5.7
8	14.6	8.4	15.1	8.5	13.9	8.2
12	23.8	9.2	24.2	9.1	23.0	9.1
16	33.2	9.4	33.8	9.6	32.2	9.2
20	42.6	9.4	43.6	9.8	41.7	9.5
24	52.4	9.8	53.6	10.0	51.4	9.7
28	62.2	9.8	63.6	10.0	61.2	9.8
32	71.9	9.7	73.5	9.9	71.1	9.9
36	81.6	9.7	83.3	9.8	81.0	9.9
40	91.3	9.7	93.1	9.8	90.9	9.9
42	96.3	5.0	103.0	9.9	95.9	5.0
44	101.3	5.0	108.0	5.0*	100.9	5.0
46	106.2	4.9*	113.1	5.1	105.9	5.0
48	111.3	5.1	118.1	5.0	110.9	5.0*
50	116.4	5.1	123.2	5.1	115.9	5.0
52	121.5	5.1	128.2	5.0	120.9	5.0
54	126.6	5.1	133.3	5.1	125.9	5.0
56	131.7	5.1	.....	.....	130.9	5.0
58	.....	.....	.....	.....	135.9	5.0
		6)30.4		30.3		30.0
		2)5.0666		5.05		5.0
		2.5333		2.525		2.5
		2.5250				
		2.5000				
		3)7.5583				
		2.5194				

WEDNESDAY, November 11, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 49°;—In the Dock, 47°.—Wind, East, Moderate Breeze.

System Three-fold.

T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.8	5.8	7.1	7.1
8	14.3	8.5	16.0	8.9
12	23.6	9.3	25.5	9.5
16	33.4	9.8	35.4	9.9
20	43.3	9.9	45.4	10.0
24	53.5	10.2	55.6	10.2
28	63.5	10.0	65.7	10.1
32	73.7	10.2	75.4	9.7
36	83.8	10.1	85.2	9.8
40	94.1	10.3	90.2	5.0
42	99.3	5.2	95.2	5.0
44	104.4	5.1*	100.3	5.1
46	109.5	5.1	105.4	5.1*
48	114.7	5.2	110.5	5.1
50	119.8	5.1	115.6	5.1
52	124.9	5.1	120.8	5.2
54	130.0	5.1	126.0	5.2
56	.....	.....	131.1	5.1
		6)30.7		30.8
		2)5.11667		5.13333
		2.55333†		2.56667
		2.56667		
		2.50000		
		2.52500		
		2.53333		
		2.59166		
		2.56667		
		2.59166		
		8)20.42832‡		
		2.55354§	Velocity with a Motive Wt. of 33 lbs. 8 oz.	

† Query 2.55833?

‡ Query 20.43332?

§ Query 2.55433?

WEDNESDAY, October 14, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 66°;—In the Dock, 59°.—Wind, S. W. Light Breeze.

System Three-fold.

Total Wt. 207 lbs.			M. Wt. 67 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.1	4.1	4.5	4.5
4	9.5	5.4	10.1	5.6
6	15.7	6.2	16.4	6.3
8	22.2	6.5	23.1	6.7
10	28.9	6.7	30.0	6.9
12	35.9	7.0	36.9	6.9
14	43.0	7.1	44.0	7.1
16	50.1	7.1	51.0	7.0
18	57.1	7.0	58.2	7.2
20	64.2	7.1	65.4	7.2
22	71.3	7.1	72.7	7.3
24	78.3	7.0	79.8	7.1
26	85.4	7.1	87.1	7.3
28	92.6	7.2	94.2	7.1*
30	99.8	7.2	101.5	7.3
32	107.0	7.2	108.6	7.1
34	114.2	7.2	115.7	7.1
36	121.4	7.2*	.....	.....
		2)7.2		4)28.6
		3.600		7.15
		3.575		3.575
		2)7.175		
		3.5875		

THURSDAY, October 29, 1795. WEDNESDAY, November 11, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 49°;—In the Dock, 47°.—Wind, East, Moderate Breeze.

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.6	4.6	3.9	3.9
4	10.2	5.6	9.2	5.3
6	16.2	6.0	15.2	6.0
8	22.5	6.3	21.3	6.1
10	29.0	6.5	27.7	6.4
12	35.5	6.5	34.3	6.6
14	42.2	6.7	40.9	6.6
16	49.1	6.9	47.6	6.7
18	56.1	7.0	54.3	6.7
20	63.0	6.9	61.1	6.8
22	69.9	6.9	67.8	6.7
24	76.8	6.9	74.6	6.8
26	83.8	7.0*	81.4	6.8
28	90.8	7.0	88.4	7.0*
30	97.7	6.9	95.5	7.1
32	104.7	7.0	102.5	7.0
34	111.7	7.0	109.6	7.1
36	118.8	7.1	116.8	7.2
38	125.9	7.1	123.9	7.1
40	132.9	7.0	130.9	7.0
42	.....	.....	138.0	7.1
		8)56.1		56.6
		2)7.0125		7.075
		3.5062		3.5375
		3.5375		
		2)7.0437		
		3.5218		

System Three-fold.

Total Wt. 207 lbs. Motive Wt. 67 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.6	3.6	3.6	3.6
4	8.8	5.2	8.9	5.3
6	14.7	5.9	14.9	6.0
8	21.1	6.4	21.4	6.5
10	27.7	6.6	28.0	6.6
12	34.4	6.7	34.8	6.8
14	41.3	6.9	41.6	6.8
16	48.2	6.9	48.6	7.0
18	55.2	7.0	55.4	6.8
20	62.1	6.9	62.2	6.8
22	69.1	7.0	68.9	6.7
24	76.2	7.1	75.7	6.8
26	83.4	7.2*	82.6	6.9*
28	90.5	7.1	89.6	7.0
30	97.6	7.1	96.6	7.0
32	104.7	7.1	103.7	7.1
34	111.6	6.9	110.6	6.9
36	118.5	6.9	117.6	7.0
38	125.4	6.9	124.7	7.1
40	132.5	7.1	131.7	7.0
		8)56.3		56.0
		2)7.0375		7.0
		3.5187		3.5
		3.5000		
		3.5375		
		3.5062		
		3.5750		
		3.6000		
		6)21.2374		
		3.5396 Velocity with a Motive Wt. of 67 lbs.		

WEDNESDAY, October 14, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 66°;—In the Dock, 59°.
—Wind, S. W. Light Breeze.

System Three-fold.

T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.7	6.7	5.9	5.9
4	14.5	7.8	13.5	7.6
6	22.8	8.3	21.6	8.1
8	31.4	8.6	30.1	8.5
10	40.0	8.6	38.5	8.4
12	48.6	8.6	47.0	8.5
14	57.2	8.6	55.4	8.4
16	65.8	8.6	63.7	8.3
18	74.5	8.7	72.3	8.6
20	83.2	8.7*	80.8	8.5
22	91.8	8.6	89.5	8.7*
24	100.6	8.8	98.0	8.5
26	109.2	8.6	106.7	8.7
28	117.8	8.6	115.5	8.8
30	.....	.....	124.1	8.6
		5)43.3		43.3
		2)8.66		8.66
		4.33		4.33

System Three-fold.

T. Wt. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.8	5.8	5.5	5.5
4	13.1	7.3	12.6	7.1
6	20.6	7.5	20.4	7.8
8	28.6	8.0	28.2	7.8
10	36.8	8.2	36.4	8.2
12	45.2	8.4	44.7	8.3
14	53.6	8.4	53.2	8.5
16	62.2	8.6	61.7	8.5
18	70.8	8.6	70.2	8.5
20	79.5	8.7	78.7	8.5
22	88.0	8.5	87.2	8.5
24	96.6	8.6*	95.8	8.6*
26	105.2	8.6	104.5	8.7
28	113.9	8.7	113.1	8.6
30	122.6	8.7	121.7	8.6
32	131.2	8.6	130.3	8.6
		5)43.2		43.1
		2)8.64		8.62
		4.32		4.31
		4.31		
		2)8.63		
		4.315		

Digitized by Google

FRIDAY, November 13, 1795.

Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 52½°;—In the Dock 47½°.—Wind, West, Moderate.

System Three-fold.

T. W. 307 lbs. 8 oz.			M. Wt. 100 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.9	5.9	5.0	5.0
4	13.2	7.3	11.9	6.9
6	20.9	7.7	19.7	7.8
8	28.8	7.9	27.7	8.0
10	37.0	8.2	35.9	8.2
12	45.2	8.2	44.3	8.4
14	53.5	8.3	52.8	8.5
16	61.9	8.4	61.4	8.6
18	70.4	8.5	70.0	8.6
20	79.0	8.6	78.6	8.6
22	87.6	8.6	87.0	8.4
24	96.3	8.7*	95.6	8.6
26	104.9	8.6	104.2	8.6
28	113.5	8.6	112.8	8.6
30	122.1	8.6	121.4	8.6*
		4)34.5		2)8.6
		2)8.625		4.3
		4.3125		
		4.3000		
		4.3100		
		4.3200		
		4.3300		
		4.3300		
		6)25.9025		
		4.3171 Velocity with a Motive Wt. of 100 lbs. 8 oz.		

WEDNESDAY, October 14, 1795.

Thermometer in the Air, 66°;—In the Dock, 59°.—Wind, S. W. Light Breeze.

System Three-fold.

Total Wt. 410 lbs.			Motive Wt. 134 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.6	8.6	7.5	7.5
4	15.5	6.9	16.4	8.9
6	25.0	9.5	25.8	9.4
8	34.7	9.7	35.4	9.6
10	44.5	9.8	45.3	9.9
12	54.3	9.8	55.0	9.7
14	64.4	10.1	64.8	9.8
16	74.3	9.9	74.7	9.9
18	84.4	10.1	84.5	9.8
20	94.5	10.1	94.2	9.7
22	104.6	10.1*	104.2	10.0*
24	114.6	10.0	114.2	10.0
		2)20.1		20.0
		2)10.05		10.0
		5.025		5.0
		5.000		
		2)10.025		
		5.0125		

WEDNESDAY, November 11, 1795.

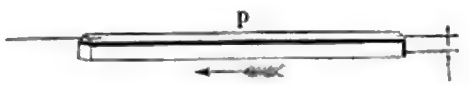
Parallelopipedon p, lengthened by the addition of an equilateral triangle at its foremost extremity; to its aftermost extremity was fixed a round iron bar, sustaining a square iron plane containing 2.9718 superficial feet, and the centre of the plane was immersed nine feet.

Thermometer in the Air, 49°;—In the Dock, 47°.—Wind, East, Moderate Breeze.

System Three-fold.

Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.								
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.6	6.6	6.3	6.3	7.6	7.6	6.0	6.0
4	15.3	8.7	14.8	8.5	16.6	9.0	14.2	9.2
6	24.6	9.3	24.0	9.2	25.5	8.9	23.0	8.8
8	34.3	9.7	33.3	9.3	34.6	9.1	32.0	9.0
10	43.9	9.6	42.7	9.4	44.0	9.4	41.4	9.4
12	53.7	9.8	52.5	9.8	53.5	9.5	50.7	9.3
14	63.5	9.8	62.3	9.8	63.3	9.8	60.4	9.7
16	73.4	9.9	72.1	9.8	73.3	10.0	70.1	9.7
18	83.2	9.8	82.0	9.9	83.2	9.9	80.2	10.1
20	93.2	10.0	91.9	9.9	93.1	9.9	90.3	10.1
22	103.1	9.9*	101.7	9.8*	102.9	9.8*	100.4	10.1*
24	113.1	10.0	111.5	9.8	112.6	9.7	110.3	9.9
26	123.1	10.0	121.4	9.9	122.5	9.9	120.2	9.9
28	133.1	10.0	.....	.....	.....	.....	.....	.....
		4)39.9		3)29.5		29.4		29.9
		2)9.975		9.8333		9.8		9.9666
		4.9875		4.9166		4.9		4.9833
		4.9166						
		4.9833						
		5.0000						
		5.0250						
		4.9000						
		6)29.8124						
		4.9687	Velocity with a Motive Wt. of 134 lbs.					

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 2 feet 4.686 inches.



	Motive Weights.									
	lbs. oz. drs. 2 1 8	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment	1.5458	2.205	3.050	4.1361	5.5750	7.650	.....	.....	.....
Hutt. Correction, or Regular Series	1.5715	2.1567	2.9666	4.0618	5.5743	7.650	9.2061	10.498	11.625

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.7781	3.5499	8.6265	16.197	26.402	39.357	55.160	73.896	95.639	120.46	148.41	179.56	233.42

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz. drs.	lbs. oz.														
2 1 8 and	4 3	1.9515													
	8 6	2.0398	4 3..	8 6	2.1366										
	16 12	2.1128		16 12	2.2039	8 6..	16 12	2.2755							
	33 8	2.1614		33 8	2.2418		33 8	2.2985	16 12..	33 8	2.3219				
	67 0	2.1673		67 0	2.2288		67 0	2.2614		67 0	2.2543	33 8..	67	2.1906	

15)32.8461

Mean 33 lbs. 8 oz. and 67 lbs. 2.1898

FRIDAY, October 2, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 2 feet 4.686 inches.

Thermometer in the Air, 65½°.—In the Dock, 64°.—Wind, S. W. Fresh Breeze.

System Three-fold.

T. w. 6lbs. 5oz. 8drs.			M. w. 2lbs. 1oz. 8drs.	
Accelerating Wt. 2 lbs.			Accel. Wt. 2 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.0	3.0	2.0	2.0
8	6.3	3.3	6.5	4.5
12	10.2	3.9	10.4	3.9
16	14.4	4.2	14.7	4.3
20	19.1	4.7	19.4	4.7
24	23.9	4.8	24.4	5.0
28	29.2	5.3	29.7	5.3
32	34.6	5.4	35.3	5.4
36	40.3	5.7	41.1	5.8
40	46.2	5.9	47.1	6.0
44	52.3	6.1	53.2	6.1
48	58.4	6.1	59.5	6.3
52	64.5	6.1	65.8	6.3
56	70.8	6.3	72.1	6.3
60	76.8	6.0	78.4	6.3
64	83.0	6.2	84.8	6.4
68	89.2	6.2	91.1	6.3
72	95.4	6.2	97.4	6.3
76	101.6	6.2	103.7	6.3
78	104.7	3.1	106.9	3.2
80	107.7	3.0	110.0	3.1
82	110.8	3.1	113.2	3.2
84	113.9	3.1	116.4	3.2
86	117.0	3.1	119.5	3.1
88	120.0	3.0*	122.7	3.2*
90	123.0	3.0	125.8	3.1
92	126.1	3.1	128.9	3.1
94	129.2	3.1	132.0	3.1
96	132.2	3.0	135.2	3.2
98	135.3	3.1	138.3	3.1
		6)18.3		18.8
		2)3.05		3.1333
		1.5250		1.5667
		1.5667		
		2)3.0917		
		1.5458 Velocity with a Motive Wt. of 2 lbs. 1 oz. 8 drs.		

FRIDAY, October 2, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 2 feet 4.686 inches.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. 4 lbs.			Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.2	3.2	2.7	2.7
8	7.5	4.3	6.7	4.7
12	12.7	5.2	11.5	4.8
16	18.8	6.1	17.2	5.7
20	25.7	6.9	23.8	6.6
24	33.1	7.4	31.1	7.3
28	41.2	8.1	38.8	7.7
32	49.4	8.2	47.0	8.2
36	57.8	8.4	55.3	8.3
40	66.4	8.6	63.7	8.4
44	74.9	8.5	72.2	8.5
48	83.6	8.7	80.8	8.6
52	92.3	8.7	89.3	8.4
54	96.6	4.3	97.9	8.6
56	101.1	4.5	106.7	8.8
58	105.4	4.3	111.0	4.3
60	109.8	4.4	115.4	4.4
62	114.2	4.4	119.8	4.4
64	118.6	4.4	124.2	4.4*
66	123.1	4.5*	128.5	4.3
68	127.4	4.3	133.0	4.5
70	131.8	4.4	137.4	4.4
72	136.2	4.4	141.8	4.4
74	140.7	4.5	.....	.....
		5)22.1		22.0
		2)4.42		4.4
		2.21		2.2
		2.20		
		2)4.41		
		2.205 Velocity with a Motive Wt. of 4 lbs. 3 oz.		

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	1.5	1.5	3.8	3.8
8	6.3	4.8	9.6	5.8
12	13.0	6.7	17.3	7.7
16	21.3	8.3	26.4	9.1
20	30.9	9.6	36.7	10.3
24	41.6	10.7	47.8	11.1
28	53.0	11.4	59.4	11.6
32	64.7	11.7	71.3	11.9
36	76.4	11.7	83.2	11.9
38	82.4	6.0	89.1	5.9
40	88.2	5.8	95.1	6.0
42	94.1	5.9	101.0	5.9
44	100.2	6.1	107.1	6.1
46	106.2	6.0	113.1	6.0
48	112.2	6.0	119.2	6.1
50	118.3	6.1*	125.2	6.0*
52	124.4	6.1	131.4	6.2
54	130.5	6.1	137.4	6.0
56	136.6	6.1	143.6	6.2
		4)24.4		24.4
		2)6.1		6.1
		3.05		3.05
		3.05		
		2)6.10		
		3.05 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

Digitized by Google

FRIDAY, October 2, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 2 feet 4.686 inches.

System Three-fold

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.2	2.2	3.8	3.8	2.8	2.8
4	5.4	3.2	8.5	4.7	6.6	3.8
6	9.6	4.2	14.2	5.7	11.4	4.8
8	14.7	5.1	20.6	6.4	17.1	5.7
10	20.7	6.0	27.6	7.0	23.4	6.3
12	27.4	6.7	35.2	7.6	30.6	7.2
14	34.6	7.2	43.0	7.8	38.1	7.5
16	42.3	7.7	51.0	8.0	46.0	7.9
18	50.3	8.0	59.1	8.1	53.9	7.9
20	58.4	8.1	67.2	8.1	62.0	8.1
22	66.9	8.5	75.2	8.0	70.2	8.2
24	75.2	8.3	83.5	8.3	78.4	8.2
26	83.4	8.2	91.6	8.1*	86.6	8.2
28	91.8	8.4*	99.9	8.3	94.8	8.2*
30	100.0	8.2	108.0	8.1	103.1	8.3
32	108.2	8.2	116.3	8.3	111.4	8.3
34	116.4	8.2	124.6	8.3	119.8	8.4
36	124.7	8.3	132.9	8.3	128.1	8.3
38	133.0	8.3	.....	.....	136.5	8.4
		6)49.6		49.4		49.9
		2)8.2666		8.2333		8.3166
		4.1333		4.1167		4.1583
		4.1167				
		4.1583				
		3)12.4083				
		4.1361 Velocity with a Motive Weight of 16 lbs. 12 oz.				

The accelerating weight in the last two experiments was hung lower than in the former one.

FRIDAY, October 2, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 2 feet 4.686 inches.

System Three-fold.

Total Weight 102 lbs. 8 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.2	6.2	3.6	3.6	4.4	4.4
4	14.2	8.0	9.4	5.8	11.0	6.6
6	23.3	9.1	17.1	7.7	19.4	8.4
8	33.5	10.2	26.0	8.9	28.8	9.4
10	43.8	10.3	36.0	10.0	39.2	10.4
12	54.4	10.6	46.4	10.4	49.6	10.4
14	65.2	10.8	57.1	10.7	60.3	10.7
16	75.9	10.7	67.7	10.6	71.2	10.9
18	86.8	10.9	78.7	11.0	81.9	10.7
20	97.8	11.0	89.6	10.9	92.9	11.0
22	109.0	11.2*	100.8	11.2	104.0	11.1*
24	120.1	11.1	111.9	11.1*	115.3	11.3
26	.....	.....	123.1	11.2	126.4	11.1
28	.....	.....	134.2	11.1	.....	.....
		2)22.3		3)33.4		33.5
		2)11.15		11.1333		11.1666
		5.5750		5.5666		5.5834
		5.5666				
		5.5834				
		3)16.7250				
		5.5750 Velocity with a Motive Wt. of 33 lbs. 8 oz.				

FRIDAY, October 2, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 2 feet 4.686 inches.

System Three-fold.

T. Wt. 207 lbs.			M. Wt. 67lbs.	
Accel. Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.3	8.3	9.4	9.4
4	20.0	11.7	21.8	12.4
6	33.7	13.7	35.9	14.1
8	48.7	15.0	50.8	14.9
10	63.8	15.1	65.8	15.0
12	78.8	15.0	81.0	15.2
14	93.8	15.0	95.9	14.9
16	109.0	15.2*	111.2	15.3*
18	124.3	15.3	126.6	15.4
		2)30.5		30.7
		2)15.25		15.35
		7.625		7.675
		7.675		
		2)15.300		
		7.650	Velocity with a Motive Wt. of 67 lbs.	

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

	Motive Weights.							
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8
Velocity per Experiment.....	1.8137	2.5166	3.5674	4.8708	6.7666	.....	.....	.....
Hutt. Correction, or Regular Series	1.8144	2.5213	3.5038	4.8693	6.7666	8.2029	9.4033	10.454

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.1939	5.1416	12.078	22.138	35.424	52.009	71.961	95.335	122.18	152.54	186.45	223.96	288.27

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. oz.	lbs. oz.										
4 3 and	8 6	2.1162	8 6..	16 12	1.9865	16 12..	33 8	2.2257	33 8..	67	2.1085
	16 12	2.0493		33 8	2.0993		67 0	2.1665			
	33 8	2.1050		67 0	2.1024						
	67 0	2.1058									

10)21.0642

Mean 4 lbs. 3 oz. and 67 lbs... 2.1064

TUESDAY, October 13, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

Thermometer in the Air, 61°;—In the Dock, 62°.
—Wind, S. W. Fresh Breeze.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.8	2.8	2.8	2.8
8	6.8	4.0	6.4	3.6
12	11.5	4.7	10.8	4.4
16	16.5	5.0	15.7	4.9
20	22.0	5.5	21.0	5.3
24	27.9	5.9	26.8	5.8
28	34.0	6.1	32.8	6.0
32	40.3	6.3	39.1	6.3
36	46.8	6.5	45.6	6.5
40	53.4	6.6	52.2	6.6
44	60.3	6.9	59.0	6.8
48	67.2	6.9	65.9	6.9
52	74.2	7.0	72.8	6.9
56	81.2	7.0	79.7	6.9
60	88.2	7.0	86.6	6.9
64	95.3	7.1	93.7	7.1
68	102.2	6.9*	100.9	7.2*
72	109.5	7.3	107.9	7.0
76	116.7	7.2	115.1	7.2
80	123.9	7.2	122.2	7.1
84	131.2	7.3	129.2	7.0
		5)35.9		35.5
		4)7.18		7.1
		1.795		1.775
		1.775		
		2)3.570		
		1.785		

SATURDAY, October 17, 1795.

Thermometer in the Air, 58°;—In the Dock, 57°.
—Wind, S. W. Strong Breeze.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	1.8	1.8	2.6	2.6
8	4.5	2.7	6.2	3.6
12	8.0	3.5	10.4	4.2
16	12.1	4.1	15.2	4.8
20	17.0	4.9	20.5	5.3
24	22.2	5.2	26.2	5.7
28	27.9	5.7	32.3	6.1
32	34.1	6.2	38.6	6.3
36	40.4	6.3	45.2	6.6
40	46.8	6.4	52.0	6.8
44	53.6	6.8	59.1	7.1
48	60.6	7.0	66.0	6.9
52	67.5	6.9	73.2	7.2
56	74.6	7.1	80.4	7.2
60	81.8	7.2	87.8	7.4
64	89.0	7.2	95.2	7.4
68	96.3	7.3	102.6	7.4*
72	103.5	7.2*	110.0	7.4
76	110.8	7.3	117.6	7.6
80	118.2	7.4	124.9	7.3
84	125.5	7.3	132.3	7.4
88	132.9	7.4	.....	.....
		5)36.6		37.1
		4)7.32		7.42
		1.830		1.855
		1.855		
		1.775		
		1.795		
		4)7.255		
		1.8137 Velocity with a Motive Wt. of 4 lbs. 3 oz.		

Digitized by Google

TUESDAY, October 13, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

Thermometer in the Air, 61°;—In the Dock, 62°.—Wind, S. W. Fresh Breeze.

System Three-fold.

Total Weight 26 lbs. Motive Weight 8 lbs. 6 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. 4 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.6	2.6	3.3	3.3	2.8	2.8
8	6.8	4.2	8.2	4.9	7.9	5.1
12	12.4	5.6	14.2	6.0	14.4	6.5
16	19.0	6.6	21.3	7.1	22.2	7.8
20	26.4	7.4	29.1	7.8	31.0	8.8
24	34.4	8.0	37.6	8.5	40.5	9.5
28	42.9	8.5	46.4	8.8	50.2	9.7
32	51.8	8.9	55.5	9.1	59.8	9.6
36	61.1	9.3	64.8	9.3	69.8	10.0
40	70.5	9.4	74.3	9.5	80.2	10.2
44	80.0	9.5	83.9	9.6	90.4	10.2
48	89.7	9.7	93.5	9.6	100.8	10.4
52	99.6	9.9	103.2	9.7	105.9	5.1
54	104.5	4.9	108.1	4.9*	111.1	5.2
56	109.5	5.0*	113.0	4.9	116.1	5.0*
58	114.5	5.0	117.9	4.9	121.2	5.1
60	119.6	5.1	123.0	5.1	126.3	5.1
62	124.7	5.1	.....	.....	131.5	5.2
		4)20.2		19.8		20.4
		2)5.050		4.95		5.1
		2.525		2.475		2.55
		2.475				
		2.550				
		3)7.550				
		2.5166 Velocity with a Motive Weight of 8 lbs. 6 oz.				

The third experiment was made on Saturday, October 17, 1795.

TUESDAY, October 13, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

System Three-fold.

T. Wt. 51 lbs. 8 oz.			M. Wt. 16 lbs. 12 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.1	2.1	2.6	2.6
4	5.1	3.0	5.9	3.3
6	8.8	3.7	10.0	4.1
8	13.2	4.4	14.6	4.6
10	18.1	4.9	19.7	5.1
12	23.5	5.4	25.3	5.6
14	29.2	5.7	31.2	5.9
16	35.2	6.0	37 4	6.2
18	41.5	6.3	43.7	6.3
20	48.1	6.6	50.4	6.7
22	54.8	6.7	57.1	6.7
24	61.4	6.6	64.0	6.9
26	68.2	6.8	70.8	6.8
28	75.2	7.0	77.8	7.0
30	82.2	7.0	84.8	7.0
32	89.1	6.9	91.9	7.1*
34	96.2	7.1*	99.0	7.1
36	103.2	7.0	106.2	7.2
38	110.3	7.1	113.3	7.1
40	117.4	7.1	120.5	7.2
42	124.5	7.1	.....	.....
		5)35.4		35.7
		2)7.08		7.14
		3.54		3.57
		3.57		
		2)7.11		
		3.555		

FRIDAY, October 16, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

Thermometer in the Air, 60½°;—In the Dock, 57°.—Wind, S.W. Strong Breeze.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.2	3.2	2.1	2.1	2.8	2.8
4	7.2	4.2	5.2	3.1	6.4	3.6
6	12.0	4.8	9.2	4.0	10.5	4.1
8	17.4	5.4	13.9	5.7	15.5	5.0
10	23.2	5.8	19.2	5.3	21.0	5.5
12	29.4	6.2	25.1	5.9	27.1	6.1
14	36.2	6.8	31.3	6.2	33.4	6.3
16	43.1	6.9	38.0	6.7	40.2	6.8
18	50.0	6.9	44.9	6.9	47.1	6.9
20	57.0	7.0	51.9	7.0	54.1	7.0
22	64.1	7.1	59.0	7.1	61.0	6.9
24	71.2	7.1	66.0	7.0	67.9	6.9
26	78.4	7.2	73.2	7.2	75.0	7.1
28	85.4	7.0	80.4	7.2	82.1	7.1
30	92.5	7.1*	87.5	7.1*	89.1	7.0
32	99.6	7.1	94.7	7.2	96.2	7.1*
34	106.7	7.1	101.9	7.2	103.4	7.2
36	113.7	7.0	109.0	7.1	110.5	7.1
38	121.0	7.3	116.2	7.2	117.5	7.0
40	128.1	7.1	123.3	7.1	124.5	7.0
42	.....	.....	.....	.....	131.5	7.0
		6)42.7		42.9		42.4
		2)7.1166		7.15		7.0666
		3.5583		3.575		3.5333
		3.5750				
		3.5333				
		3)10.6666				
		3.5555				

SATURDAY, October 17, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

Thermometer in the Air, 58°;—In the Dock, 57°.—Wind, S. W. Strong Breeze.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.9	1.9	2.2	2.2	2.3	2.3
4	4.8	2.9	5.4	3.2	5.4	3.1
6	8.4	3.6	8.7	3.3	9.5	4.1
8	13.0	4.6	13.3	4.6	14.4	4.9
10	18.3	5.3	18.7	5.4	19.8	5.4
12	24.1	5.8	24.6	5.9	25.9	6.1
14	30.5	6.4	31.0	6.4	32.3	6.4
16	37.0	6.5	37.6	6.6	38.9	6.6
18	43.8	6.8	44.5	6.9	46.8	7.9
20	50.8	7.0	51.5	7.0	52.7	5.9
22	57.8	7.0	58.6	7.1	59.8	7.1
24	64.8	7.0	65.7	7.1	66.9	7.1
26	71.9	7.1	72.9	7.2	74.0	7.1
28	78.9	7.0	80.0	7.1	81.2	7.2
30	85.9	7.0	87.2	7.2	88.3	7.1*
32	93.0	7.1	94.3	7.1*	95.6	7.3
34	99.7	6.7	101.5	7.2	102.8	7.2
36	106.8	7.1*	108.7	7.2	.....	.....
38	113.9	7.1	116.0	7.3	.....	.....
40	121.1	7.2	123.2	7.2	.....	.....
42	128.2	7.1	.....	.....	.....	.....
		4)28.5		36.0		21.6
		2)7.125		7.2		7.2
		3.5625		3.6		3.6
		3.6000				
		3.6000				
		3.5333				
		3.5750				
		3.5583				
		3.5700				
		3.5400				
		8)28.5391				
		3.5674 Velocity with a Motive Wt. of 16 lbs. 12 oz.				

TUESDAY, October 13, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

Thermometer in the Air, 61°;—In the Dock, 62°.—Wind, S. W. Blows fresh.

System Three-fold.

lbs. oz.	lbs. oz.
T. W. 102 8	M. W. 33 8

Accelerating Wt. 14 lbs.

Sec.	Feet.	Differences.
2	3.3	3.3
4	8.4	5.1
6	15.1	6.7
8	22.9	7.8
10	31.6	8.7
12	40.7	9.1
14	50.2	9.5
16	59.9	9.7
18	69.5	9.6
20	79.1	9.6
22	88.8	9.7
24	98.5	9.7*
26	108.3	9.8
28	118.1	9.8
		3)29.3
		2)9.7667
		4.8833

SATURDAY, October 17, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

Thermometer in the Air, 58°;—In the Dock 57°.—Wind, S.W. Strong Breeze.

System Three-fold.

Total Weight 102 lbs. 8 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.6	3.6	4.4	4.4	3.6	3.6
4	9.0	5.4	9.0	4.6	9.0	5.4
6	15.9	6.9	16.2	7.2	15.9	6.9
8	23.9	8.0	23.7	7.5	23.9	8.0
10	32.7	8.8	32.4	8.7	32.7	8.8
12	41.9	9.2	41.6	9.2	41.9	8.2
14	51.3	9.4	50.8	9.2	51.3	9.4
16	60.9	9.6	60.6	9.8	60.8	9.5
18	70.5	9.6	70.2	9.6	70.4	9.6
20	80.1	9.6	79.7	9.5	80.0	9.6
22	89.7	9.6	89.4	9.7	89.6	9.6
24	99.4	9.7*	99.2	9.8*	99.4	9.8*
26	109.1	9.7	108.8	9.6	109.1	9.7
28	118.7	9.6	118.6	9.8	119.0	9.9
		3)29.0		29.2		29.4
		2)9.666		9.7333		9.8
		4.8333		4.8667		4.9
		4.8667				
		4.9000				
		4.8333				
		4)19.4833				
		4.8708 Velocity with a Motive Wt. of 33 lbs. 8 oz.				

TUESDAY, October 13, 1795.

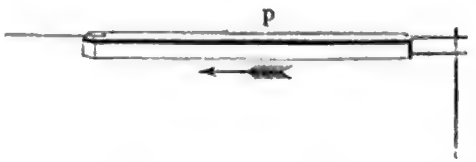
Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 5 feet 4.686 inches.

Thermometer in the Air, 61°;—In the Dock, 62°.—Wind, S. W. Blows fresh.

System Three-fold.

Total Weight 207 lbs. Motive Weight 67 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.3	5.3	6.4	6.4	7.6	7.6
4	13.8	8.5	15.8	9.4	17.8	10.2
6	23.7	9.9	27.0	11.2	29.3	11.5
8	34.8	11.1	39.3	12.3	41.9	12.6
10	46.9	12.1	52.5	13.2	54.9	13.0
12	59.3	12.4	65.5	13.0	68.0	13.1
14	72.1	12.8	78.7	13.2	81.2	13.2
16	85.2	13.1	92.2	13.5	94.7	13.5
18	98.5	13.3	105.8	13.6*	108.3	13.6*
20	111.9	13.4*	119.2	13.4	121.9	13.6
22	125.5	13.6	.....	.....	.....	.....
		2)27.0		27.0		27.2
		2)13.5		13.5		13.6
		6.75		6.75		6.8
		6.75				
		6.80				
		3)20.30				
		6.7666 Velocity with a Motive Weight of 67 lbs.				

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 8 feet 4.686 inches.



	Motive Weights.									
	lbs. oz. 4 3	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8	lbs. oz. 67 0	lbs. oz. 100 8	lbs. oz. 134 0	lbs. oz. 167 8		
Velocity per Experiment	1.535	2.2500	3.2033	4.400	6.000	.....	.....	.....		
Hutt. Correction, or Regular Series	1.5518	2.1760	3.0513	4.2887	6.000	7.3121	8.4136	9.3811		

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.7010	7.0451	16.178	29.178	46.104	67.000	91.902	120.84	153.85	190.95	232.15	277.49	354.73

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	oz.		lbs.	oz.														
4	3	and	8	6	1.8127													
			16	12	1.8844		8	6..	16	12	1.9623							
			33	8	1.9747				33	8	2.0861		16	12..	33	8	2.1837	
			67	0	2.0338				67	0	2.1201				67	0	2.2090	33 8.. 67	2.2348

10) 20.5016

Mean 4 lbs. 3 oz. and 67 lbs... 2.0502

Digitized by Google

MONDAY, October 5, 1795. THURSDAY, October 15, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 8 feet 4.686 inches.

Thermometer in the Air, 61°;—In the Dock, 62°.
—Wind, S. W. Strong Breeze.

System Three-fold.

Total Wt. 13 lbs. Motive Wt. 4 lbs. 3 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.3	2.3	3.3	3.3
8	5.3	3.0	6.7	3.4
12	8.8	3.5	10.8	4.1
16	13.0	4.2	15.3	4.5
20	17.5	4.5	20.2	4.9
24	22.3	4.8	25.2	5.0
28	27.4	4.1	30.6	5.4
32	32.7	5.3	36.1	5.5
36	38.2	5.5	41.7	5.6
40	43.8	5.6	47.4	5.7
44	49.5	5.7	53.2	5.8
48	55.3	5.8	59.1	5.9
52	61.2	5.9	65.2	6.1
56	67.1	5.9	71.2	6.0
60	73.0	5.9	77.2	6.0
64	79.0	6.0	83.3	6.1
68	85.0	6.0	89.4	6.1
72	61.1	6.1	95.5	6.1
76	97.2	6.1	101.6	6.1
80	103.4	6.2	107.8	6.2
84	109.5	6.1*	113.8	6.0*
88	115.7	6.2	120.0	6.2
92	121.8	6.1	126.2	6.2
96	128.0	6.2	132.3	6.1
100	134.1	6.1	138.5	6.2
		5)30.7		30.7
		4)6.14		6.14
		1.535		1.535
		1.535		
		2)3.070		
		1.535 Velocity with a Motive Wt. of 4 lbs. 3 oz.		

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.2	4.2	3.3	3.3
8	10.2	6.0	8.7	5.4
12	17.5	7.3	15.6	6.9
16	25.9	8.4	23.4	7.8
20	34.8	8.9	31.9	8.5
24	43.8	9.0	40.5	8.6
28	52.8	9.0	49.3	8.8
32	61.6	8.8	58.0	8.7
36	70.6	9.0	66.7	8.7
40	79.4	8.8	75.4	8.7
44	88.2	8.8	84.0	8.6
48	97.1	8.9	92.7	8.7
50	101.6	4.5	101.8	9.1
52	106.1	4.5	106.3	4.5*
54	110.6	4.5*	110.8	4.5
56	115.1	4.5	115.2	4.4
58	119.6	4.5	119.7	4.5
60	124.2	4.6	124.2	4.5
62	128.7	4.5	.....	.....
		5)22.6		22.4
		2)4.52		4.48
		2.26		2.24
		2.24		
		2)4.50		
		2.25 Velocity with a Motive Wt. of 8 lbs. 6 oz.		

Digitized by Google

WEDNESDAY, October 14, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 8 feet 4.686 inches.

Thermometer in the Air, 66°;—In the Dock 59°.—Wind, S.W. Light Breeze.

System Three-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 16 lbs. 12 oz.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.1	2.1	2.6	2.6	2.4	2.4
4	5.0	2.9	6.0	3.4	5.8	3.4
6	8.5	3.5	10.0	4.0	10.0	4.2
8	12.6	4.1	14.5	4.5	15.1	5.1
10	17.2	4.6	19.4	4.9	20.6	5.5
12	22.1	4.9	24.6	5.2	26.6	6.0
14	27.3	5.2	30.1	5.5	32.8	6.2
16	32.8	5.5	35.9	5.8	39.0	6.2
18	38.3	5.5	41.8	5.9	45.4	6.4
20	44.2	5.9	47.8	6.0	51.6	6.2
22	50.1	5.9	53.9	6.1	57.9	6.3
24	56.2	6.1	60.1	6.2	64.2	6.3
26	62.2	6.0	66.4	6.3	70.6	6.4
28	68.4	6.2	72.7	6.3	76.9	6.3
30	74.6	6.2	79.1	6.4	83.2	6.3
32	80.8	6.2	85.5	6.4	89.6	6.4
34	87.1	6.3	91.8	6.3	96.0	6.4*
36	93.5	6.4	98.2	6.4*	102.4	6.4
38	99.8	6.3	104.6	6.4	108.8	6.4
40	106.2	6.4*	.....	.....	115.2	6.4
42	112.6	6.4	.....	.....	121.7	6.5
		2)12.8		12.8		5)32.1
		2)6.4		6.4		6.42
		3.20		3.2		3.21†
		3.20				
		3.21				
		3)9.61				
		3.2033 Velocity with a Motive Wt. of 16 lbs. 12 oz.				

† The third experiment was made on Thursday, October 15, 1795.

WEDNESDAY, October 14, 1795.

Parallelopipedon p, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 8 feet 4.686 inches.

System Three-fold.

Total Weight 102 lbs. 8 oz. Motive Weight 33 lbs. 8 oz.						
Accelerating Wt. none.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.2	3.2	3.1	3.1	2.8	2.8
4	7.9	4.7	8.0	4.9	7.6	4.8
6	13.8	5.9	14.4	6.4	13.8	6.2
8	20.6	6.8	21.8	7.4	21.1	7.3
10	28.1	7.5	29.7	7.9	29.1	8.0
12	35.9	7.8	38.1	8.4	37.8	8.7
14	44.2	8.3	46.5	8.4	46.5	8.7
16	52.6	8.4	55.1	8.6	55.4	8.9
18	61.0	8.4	63.7	8.6	64.3	8.9
20	69.6	8.6	72.5	8.8	73.2	8.9
22	78.3	8.7	81.2	8.7	81.9	8.7
24	87.0	8.7	89.9	8.7	90.6	8.8†
26	95.7	8.7	98.6	8.7*	99.4	8.8*
28	104.5	8.8*	107.5	8.9	108.2	8.8
30	113.3	8.8	.....	.....	.....	.....
		2)17.6		17.6		17.6
		2)8.8		8.8		8.8
		4.4		4.4		4.4
		4.4				
		4.4				
		3)13.2				
		4.4 Velocity with a Motive Weight of 33 lbs. 8 oz.				

† Query 8.7?

SATURDAY, November, 7, 1795.

Parallelopipedon ꝑ, &c. with the round iron bar, but without the plane, the lower extremity of the iron bar being immersed 8 feet 4.686 inches.

Thermometer in the Air, 55½°;—In the Dock, 49½°.—Wind, West, Blows fresh.

System Three-fold.

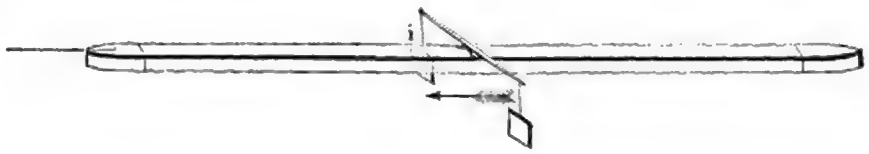
Total Weight 207 lbs. Motive Weight 67 lbs.										
Accel. Wt. none.			A. Wt. 28 lbs.		A. Wt. 28 lbs.		A. Wt. 42 lbs.		A. Wt. 42 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.5	5.5	7.4	7.4	5.7	5.7	6.7	6.7	6.1	6.1
4	13.5	8.0	17.2	9.8	14.6	8.9	16.4	9.7	15.3	9.2
6	23.1	9.6	28.2	11.0	25.1	10.5	27.5	11.1	26.3	11.0
8	33.5	10.4	39.9	11.7	36.6	11.5	39.5	12.0	38.2	11.9
10	44.7	11.2	51.6	11.7	48.5	11.9	51.4	11.9	50.3	12.1
12	55.9	11.2	63.3	11.7	60.3	11.8	63.2	11.8	62.2	11.9
14	67.4	11.5	75.0	11.7	72.1	11.8	74.8	11.6	73.9	11.7
16	79.2	11.8	86.9	11.9	83.8	11.7	86.6	11.8	85.6	11.7
18	91.0	11.8	98.6	11.7	95.7	11.9	98.6	12.0	97.5	11.9
20	102.9	11.9	110.6	12.0*	107.7	12.0	110.6	12.0	109.5	12.0
22	114.9	12.0*	.....	.....	119.7	12.0*	122.6	12.0*	121.5	12.0*
		2)12.0		12.0		12.0		12.0		12.0
		6.0		6.0		6.0		6.0		6.0
		6.0								
		6.0								
		6.0								
		6.0								
		5)30.0								
		6.0 Velocity with a Motive Weight of 67 lbs.								

The first three experiments were made on Wednesday, October 14, 1795.

EXPERIMENTS MADE FOR ASCERTAINING THE RESISTANCE OF A PLANE WHEN PLACED OBLIQUELY TO THE SHOCK OF RUNNING WATER.

Parallelopipedon i, with two square iron planes 7 feet $10\frac{1}{4}$ inches asunder, the centre of each plane being immersed three feet below the surface of the water. Area of each plane 2.9718 feet.

In these Experiments the planes were turned outwards, or from the conducting figure.



	Angles of Incidence.								
	90°	80°	70°	60°	50°	40°	30°	20°	10°
lbs. oz.									
Velocity per Experiment, M. Wt. 134 0	3.9562	4.0750	4.1750	4.2666	4.4500	4.8222	4.675	5.7083	7.2833
..... 33 8	1.9937	2.0312	2.0500	2.1500	2.2500	2.3333	2.500	3.2500	4.1583
	Feet per Second.								
	6	6	6	6	6	6	6	6	6
Motive Weights.....	311.18	289.51	271.69	267.07	246.00*	203.40	232.87	137.55	124.90
Conductor and Bars	55.30	55.30	55.30	55.30	55.30	55.30	55.30	55.30	55.30
Resistance of Planes	255.88	234.21	216.39	211.77	184.70	148.10	177.57	82.25	69.60
Powers	2.0229	1.9912	1.9491	2.0228	2.0327	1.9097	2.2148	2.4612	2.4734

* Should be 240.00?

TUESDAY, November 3, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

Thermometer in the Air, 45°;—In the Dock, 50°.
—Wind, North, Light Breeze.

System Three-fold.

Angle of Incidence, 90°.				
Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.9	4.9	3.7	3.7
4	11.2	6.3	9.3	5.6
6	18.3	7.1	16.1	6.8
8	25.7	7.4	23.4	7.3
10	33.2	7.5	31.0	7.6
12	40.8	7.6	38.6	7.6
14	48.4	7.6	46.4	7.8
16	56.2	7.8	54.1	7.7
18	63.9	7.7	61.9	7.8
20	71.7	7.8	69.7	7.8
22	79.6	7.9	77.6	7.9
24	87.6	8.0*	85.4	7.8
26	95.5	7.9	93.3	7.9*
28	103.4	7.9	101.3	8.0
30	111.3	7.9	109.1	7.8
32	.....	.....	117.0	7.9
		4)31.7		31.6
		2)7.925		7.9
		3.9625		3.95
		3.9500		
		2)7.9125		
		3.9562 Velocity with a M. Wt. of 134 lbs.		

System Three-fold.

Angle of Incidence, 80°.				
Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.2	4.2	4.5	4.5
4	9.9	5.7	10.2	5.7
6	16.4	6.5	16.7	6.5
8	23.4	7.0	23.8	7.1
10	30.7	7.3	31.2	7.4
12	38.3	7.6	38.8	7.6
14	46.1	7.8	46.5	7.7
16	53.8	7.7	54.3	7.8
18	61.7	7.9	62.3	8.0
20	69.6	7.9	70.3	8.0
22	77.6	8.0	78.3	8.0
24	85.6	8.0	86.4	8.1*
26	93.8	8.2*	94.6	8.2
28	101.9	8.1	102.8	8.2
30	110.0	8.1	111.0	8.2
32	118.1	8.1	.....	.....
		4)32.5		32.7
		2)8.125		8.175
		4.0625		4.0875
		4.0875		
		2)8.1500		
		4.0750 Velocity with a Motive Wt. of 134 lbs.		

TUESDAY, November 3, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold

Angle of Incidence, 70°.				
Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.5	4.5	4.8	4.8
4	10.3	5.8	10.8	6.0
6	17.1	6.8	17.7	6.9
8	24.2	7.1	24.9	7.2
10	31.7	7.5	32.5	7.6
12	39.4	7.7	40.2	7.7
14	47.2	7.8	48.3	8.1
16	55.1	7.9	56.3	8.0
18	63.2	8.1	64.5	8.2
20	71.4	8.2	72.7	8.2
22	79.7	8.3	80.9	8.2
24	87.9	8.2	89.1	8.2
26	96.3	8.4*	97.5	8.4*
28	104.7	8.4	105.8	8.3
30	113.0	8.3	114.1	8.3
		3)25.1		25.0
		2)8.3666		8.3333
		4.1833		4.1666
		4.1667		
		2)8.3500		
		4.1750 Velocity with a M. Wt. of 134 lbs.		

System Three-fold.

Angle of Incidence, 60°.		
T. W. 410 lbs. 4 oz.		M. W. 134 lbs.
Accelerating Wt. none.		
Sec.	Feet.	Differences.
2	4.2	4.2
4	10.1	5.9
6	16.8	6.7
8	24.2	7.4
10	31.9	7.7
12	39.9	8.0
14	48.1	8.2
16	56.4	8.3
18	64.7	8.3
20	73.1	8.4
22	81.6	8.5
24	90.0	8.4
26	98.5	8.5*
28	107.0	8.5
30	115.6	8.6
		3)25.6
		2)8.5333
		4.2666 Velocity with a M. Wt. of 134 lbs.

TUESDAY, November 3, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence 50°.				
T. Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accel. Wt. none.			Accel. Wt. 42 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.3	5.3	3.6	3.6
4	11.9	5.6†	11.7	8.1
6	19.2	7.3	19.2	7.5
8	27.0	7.8	27.1	7.9
10	35.2	8.2	35.4	8.3
12	43.6	8.4	43.8	8.4
14	52.2	8.6	52.5	8.7
16	60.9	8.8‡	61.3	8.8
18	69.6	8.7	70.2	8.9
20	78.4	8.8	79.0	8.8
22	87.2	8.8*	88.0	9.0*
24	96.2	9.0	96.8	8.8
26	105.1	8.9	105.7	8.9
28	114.0	8.9	114.6	8.9
		4)35.6		35.6
		2)8.9		8.9
		4.45		4.45
		4.45		
		2)8.90		
		4.45 Velocity with a Motive Weight of 134 lbs.		

† Query 6.6?

‡ Query 8.7?

TUESDAY, November 3, 1795.

Parallelopipedon i, with two square iron planes 7 feet $10\frac{1}{2}$ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence, 40°.						
Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.						
Accel. Wt. 42 lbs.			A. Wt. 42 lbs.		A. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.5	6.5	7.7	7.7	4.7	4.7
4	14.0	7.5	15.8	8.1	11.6	6.9
6	22.1	8.1	24.4	8.6	19.6	8.0
8	30.6	8.5	33.1	8.7	28.1	8.5
10	39.1	8.5	42.0	8.9	36.9	8.8
12	48.0	8.9	51.1	9.1	45.8	8.9
14	57.2	9.2	60.4	9.3	54.9	9.1
16	66.5	9.3	69.8	9.4	64.1	9.2
18	75.9	9.4	79.2	9.4	73.5	9.4
20	85.4	9.5	88.7	9.5	83.0	9.8
22	95.0	9.6*	98.3	9.6*	92.6	9.6*
24	104.7	9.7	108.0	9.7	102.1	9.5
26	.....	.....	.....	.....	111.9	9.8
		2)19.3		19.3		3)28.9
		2)9.65		9.65		9.6333
		4.8250		4.825		4.8166
		4.8250				
		4.8166				
		3)14.4666				
		4.8222 Velocity with a Motive Weight of 134 lbs.				

WEDNESDAY, November 4, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

Thermometer in the Air, 41°;—In the Dock, 49°.
—Calm.

System Three-fold.

Angle of Incidence, 30°.				
Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accelerating Wt. 56 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.3	5.3	6.7	6.7
4	13.1	7.8	15.2	8.5
6	22.2	9.1	24.5	9.3
8	31.7	9.5	34.0	9.5
10	41.0	9.3	53.4‡	9.4
12	50.3	9.3	52.6	9.2
14	59.7	9.4	61.8	9.2
16	69.0	9.3	71.1	9.3
18	78.3	9.3	80.4	9.3
20	87.6	9.3	89.5	9.1
22	97.0	9.4	98.8	9.3
24	106.4	9.4	108.1	9.3
26	115.8	9.4*	117.4	9.3*
		2)9.4†		9.3
		4.70		4.65
		4.65		
		2)9.35		
		4.675 Velocity with a M. Wt. of 134 lbs.		

System Three-fold.

Angle of Incidence, 20°.				
Total Wt. 410 lbs. 4 oz.			M. Wt. 134 lbs.	
Accel. Weight 84 lbs.			Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.7	3.7	6.5	6.5
4	12.7	9.0	15.9	9.4
6	23.3	10.6	26.9	11.0
8	34.4	11.1	38.1	11.2
10	45.8	11.4	49.5	11.4
12	57.2	11.4	60.9	11.4
14	68.5	11.3	72.3	11.4
16	79.9	11.4	82.7§	11.4
18	91.3	11.4*	95.1	11.4*
20	102.8	11.5	106.5	11.4
22	114.2	11.4	.....	.....
		3)34.3		2)22.8
		2)11.4333		11.4
		5.7166		5.7
		5.7000		
		2)11.4166		
		5.7083 Velocity with a Motive Wt. of 134 lbs.		

† The first experiment was made on Tuesday, November 3, 1795.
‡ Query 43.4?
§ Query 83.7?

WEDNESDAY, November 4, 1795.

Parallelopipedon i, with two square iron planes 7 feet $10\frac{1}{2}$ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence, 10°.						
Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.						
Accelerating Wt. 84 lbs.			Accel. Wt. 84 lbs.		Accel. Wt. 84 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.6	5.6	6.2	6.2	6.2	6.2
4	15.0	9.4	16.0	9.8	15.9	9.7
6	27.2	12.2	28.3	12.3	28.1	12.2
8	40.4	13.2	41.9	13.6	41.7	13.6
10	54.4	14.0	56.1	14.2	55.7	14.0
12	68.7	14.3	70.4	14.3	70.0	14.3
14	83.3	14.6*	84.9	14.5*	84.5	14.5*
16	97.9	14.6	99.4	14.5	99.2	14.7
18	112.5	14.6	114.1	14.7	113.6	14.4
		3)43.8		43.7		43.6
		2)14.6		14.5666		14.5333
		7.3000		7.2833		7.2667
		7.2833				
		7.2667				
		3)21.8500				
		7.2833 Velocity with a Motive Weight of 134 lbs.				

TUESDAY, November 17, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

Thermometer in the Air, 47°;—In the Dock, 44½°.
—Wind, W. S. W. Moderate.

System Three-fold.

Angle of Incidence, 90°.				
Total Wt. 102 lbs. 8 oz.		M. Wt. 33 lbs. 8 oz.		
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.5	3.5	3.8	3.8
8	9.1	5.6	9.4	5.6
12	15.3	6.2	16.0	6.6
16	22.6	7.3	23.0	7.0
20	29.8	7.2	30.2	7.2
24	37.3	7.5	37.5	7.3
28	44.9	7.6	45.2	7.7
32	52.6	7.7	52.9	7.7
36	60.5	7.9	60.9	8.0
40	68.3	7.8	68.9	8.0
44	76.1	7.8	76.9	8.0
48	83.8	7.7	85.0	8.1
52	91.6	7.8	93.0	8.0
56	99.4	7.8	101.1	8.1
58	103.3	3.9	105.1	4.0
60	107.2	3.9	109.1	4.0*
62	111.2	4.0	113.2	4.1
64	115.1	3.9	117.1	3.9
66	119.0	3.9*	121.2	4.1
68	123.0	4.0	.....	.....
70	127.0	4.0	.....	.....
72	130.9	3.9	.....	.....
		4)15.8		16.1
		2)3.95		4.025
		1.9750		2.0125
		2.0125		
		2)3.9875		
		1.9937 Velocity with a M. Wt. of 33 lbs. 8 oz.		

System Three-fold.

Angle of Incidence, 80°.				
Total Wt. 102 lbs. 8 oz.		M. Wt. 33 lbs. 8 oz.		
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.4	3.4	4.0	4.0
8	8.5	5.1	9.3	5.3
12	14.7	6.2	16.2	6.9
16	21.4	6.7	23.1	6.9
20	28.5	7.1	29.4	6.3
24	35.9	7.4	37.9	8.5
28	43.6	7.7	45.5	7.6
32	51.4	7.8	53.4	7.9
36	59.2	7.8	61.3	7.9
40	67.1	7.9	69.3	8.0
44	75.1	8.0	77.3	8.0
48	82.9	7.8	85.4	8.1
52	90.8	7.9	93.4	8.0
56	98.8	8.0	101.5	8.1
58	102.8	4.0	105.5	4.0
60	106.8	4.0	109.6	4.1*
62	110.8	4.0	113.7	4.1
64	114.9	4.1*	117.7	4.0
66	118.9	4.0	121.8	4.1
68	123.0	4.1	....	.....
70	127.0	4.0	.....	.....
		4)16.2		16.3
		2)4.05		4.075
		2.0250		2.0375
		2.0375		
		2)4.0625		
		2.0312 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

Digitized by Google

THURSDAY, November 19, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10¼ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

Thermometer in the Air, 43½°;—In the Dock 44½°.
—Wind, N. W. Moderate.

System Three-fold.

Angle of Incidence, 70°.				
T. W. 102 lbs. 8 oz. M. Wt. 33 lbs. 8 oz.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.6	3.6	4.4	4.4
8	8.8	5.2	10.2	5.8
12	15.1	6.3	16.7	6.5
16	22.1	7.0	23.7	7.0
20	29.3	7.2	30.8	7.1
24	36.8	7.5	38.4	7.6
28	44.5	7.7	46.1	7.7
32	52.3	7.8	54.1	8.0
36	60.1	7.8	62.1	8.0
40	68.0	7.9	70.1	8.0
44	76.1	8.1	78.0	7.9
48	84.1	8.0	86.0	8.0
52	92.2	8.1	94.1	8.1
56	100.3	8.1	102.3	8.2
58	104.3	4.0	106.3	4.0
60	108.3	4.0	110.4	4.1
62	112.4	4.1*	114.5	4.1*
64	116.6	4.2	118.6	4.1
66	120.6	4.0	122.7	4.1
68	124.7	4.1	.....	.....

4)16.4 — 3)12.3

2)4.1 — 4.1

2.05 — 2.05

2.05

2)4.10

2.05 Velocity with a Motive Wt. of 33 lbs. 8 oz.

System Three-fold.

Angle of Incidence, 60°.			
T. W.	lbs. oz. 102 8	M. W.	lbs. oz. 33 8
Accelerating Wt. none.			
Sec.	Feet.	Differences.	
4	3.5	3.5	
8	9.0	5.5	
12	15.4	6.4	
16	22.6	7.2	
20	30.3	7.7	
24	38.2	7.9	
28	46.3	8.1	
32	54.6	8.3	
36	62.9	8.3	
40	71.2	8.3	
44	79.5	8.3	
48	87.8	8.3	
52	96.3	8.5	
54	100.6	4.3	
56	104.8	4.2	
58	109.0	4.2	
60	113.3	4.3	
62	117.6	4.3	
64	121.9	4.3*	

2)4.3

2.15 Velocity with a M. Wt. of 33 lbs. 8 oz.

THURSDAY, November 19, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence, 50°.		
T. W. lbs. oz. 102 8	M. W. lbs. oz. 33 8	
Accel. Wt. none.		
Sec.	Feet.	Differences.
4	4.3	4.3
8	10.3	6.0
12	17.2	6.9
16	24.6	7.4
20	32.6	8.0
24	41.0	8.4
28	49.4	8.4
32	58.3	8.9
36	66.8	8.5
40	75.6	8.8
44	84.4	8.8
48	93.2	8.8
50	97.6	4.4
52	102.2	4.6
54	106.6	4.4
56	111.1	4.5
58	115.6	4.5
60	120.1	4.5
62	124.6	4.5*
		2)4.5
Velocity with a Motive Wt. of 33 lbs. 8 oz.		2.25

System Three-fold.

Angle of Incidence 40°.		
T. W. lbs. oz. 102 8	M. W. lbs. oz. 33 8	
Accelerating Wt. none.		
Sec.	Feet.	Differences.
4	4.6	4.6
8	11.1	6.5
12	18.6	7.5
16	26.6	8.0
20	35.0	8.4
24	43.4	8.4
28	52.0	8.6
32	60.7	8.7
36	69.5	8.8
40	78.4	8.9
44	87.4	9.0
48	96.5	9.1
50	101.1	4.6
52	105.7	4.6
54	110.3	4.6
56	115.0	4.7*
58	119.6	4.6
60	124.3	4.7
		3)14.3
		2)4.6666
Velocity with a M. Wt. of 33 lbs. 8 oz.		2.3333

THURSDAY, November 19, 1795.

Parallelopipedon i, with two square iron planes 7 feet $10\frac{1}{7}$ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence, 30°.				
Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.5	5.5	4.2	4.2
8	13.1	7.6	11.0	6.8
12	21.9	8.8	19.3	8.3
16	31.3	9.4	28.5	9.2
20	40.9	9.6	38.2	9.7
24	50.7	9.8	48.0	9.8
28	60.7	10.0	57.9	9.9
32	70.5	9.8	67.9	10.0
36	80.4	9.9	77.8	9.9
40	90.4	10.0	87.8	10.0
44	100.4	10.0	92.8	5.0
46	105.4	5.0	97.8	5.0
48	110.4	5.0	102.8	5.0
50	115.4	5.0	107.8	5.0
52	120.4	5.0*	112.8	5.0
54	.....	.....	117.8	5.0
56	.....	.....	122.8	5.0
58	.....	.....	127.8	5.0*
		2)5.0		5.0
		2.5		2.5
		2.5		
		2)5.0		
		2.5 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

System Three-fold

Angle of Incidence, 20°.				
Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.4	4.4	4.9	4.9
8	11.8	7.4	12.8	7.9
12	21.3	9.5	22.7	9.9
16	31.8	10.5	34.0	11.3
20	43.7	11.9	46.0	12.0
24	56.1	12.4	58.4	12.4
28	68.7	12.6	71.0	12.6
32	81.4	12.7	83.8	12.8
36	94.3	12.9	96.8	13.0
38	100.8	6.5	103.3	6.5
40	107.3	6.5	109.8	6.5
42	113.8	6.5*	116.3	6.5*
44	120.2	6.4	122.8	6.5
46	126.8	6.6	129.3	6.5
		3)19.5		19.5
		2)6.5		6.5
		3.25		3.25
		3.25		
		2)6.50		
		3.25 Velocity with a Motive Wt. of 33 lbs. 8 oz.		

Digitized by Google

THURSDAY, November 19, 1795.

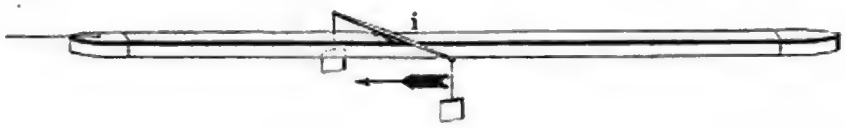
Parallelopipedon i, with two square iron planes 7 feet 10$\frac{1}{2}$ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence, 10°.				
Total Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.8	5.8	5.7	5.7
8	14.8	9.0	14.7	9.0
12	26.2	11.4	26.0	11.3
16	39.5	13.3	39.2	13.2
20	54.1	14.6	53.8	14.6
24	69.5	15.4	69.3	15.5
28	85.5	16.0	85.4	16.1
30	93.6	8.1	93.6	8.2
32	101.8	8.2	102.0	8.4
34	110.1	8.3*	110.3	8.3*
36	118.4	8.3	118.7	8.4
38	126.7	8.3	127.0	8.3
		3)24.9		25.0
		2)8.3		8.3333
		4.1500		4.1666
		4.1666		
		2)8.3166		
		4.1583	Velocity with a Motive Wt. of 33 lbs. 8 oz.	

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

In these Experiments the planes were turned inwards, or to the conducting figure.



	Angles of Incidence.								
	90°	80°	70°	60°	50°	40°	30°	20°	10°
lbs. oz.									
Velocity per Experiment, M. Wt. 134 0	.....	4.050	4.1875	4.350	4.575	4.575*	5.100	6.475	8.075
..... 33 8	.....	2.000	2.0666	2.1833	2.3166	2.400	2.6166	3.333	4.250
	Feet per Second.								
	6	6	6	6	6	6	6	6	6
Motive Weights	.....	290.07	271.47	255.84	232.52	239.97	187.81	114.30	70.552†
Conductor and Bars	.....	55.30	55.30	55.30	55.30	55.30	55.30	55.30	55.30
Resistance of Planes	.....	234.77	216.17	200.54	177.22	184.67	132.51	59.00	15.249
Powers	.....	1.9648	1.9630	2.0110	2.0372	2.1488	2.0773	2.0879	2.1599

* Most likely the angle was not altered from 50° to 40°.

† Should be 70.549?

WEDNESDAY, November 4, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10$\frac{1}{2}$ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

Thermometer in the Air, 41°;—In the Dock, 49°.—Calm.

System Three-fold.

Angles of Incidence.								
80°.			70°.		60°.		50°.	
Total Weight 410 lbs. 4 oz. Motive Weight 134 lbs.								
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.6	3.6	4.2	4.2	3.2	3.2	3.8	3.8
4	9.0	5.4	9.7	5.5	10.0	6.8	9.5	5.7
6	15.1	6.1	16.4	6.7	23.9	13.9	16.3	6.8
8	22.4	7.3	23.8	7.4	39.8	15.9	23.7	7.4
10	29.5	7.1	31.5	7.7	48.2	8.4	31.7	8.0
12	36.9	7.4	39.4	7.9	56.7	8.5	40.0	8.3
14	45.0	8.1	47.5	8.1	65.2	8.5	48.6	8.6
16	53.0	8.0	55.6	8.1	73.8	8.6	57.4	8.8
18	60.9	7.9	63.9	8.3	82.5	8.7	66.3	8.9
20	68.8	7.9	72.2	8.3	91.2	8.7*	75.4	9.1
22	76.8	8.0	80.5	8.3	99.9	8.7	84.6	9.2*
24	84.8	8.0	88.8	8.3*	108.5	8.6	93.7	9.1
26	92.9	8.1*	97.2	8.4	117.3	8.8	102.9	9.2
28	101.0	8.1	105.5	8.3	.....	.....	112.0	9.1
30	109.0	8.0	114.0	8.5	.....	.....	.....	.....
32	117.2	8.2	.....	.....	.....	.....	.....	.....
		4)32.4		33.5		34.8		36.6
		2)8.1		8.375		8.7		9.15
		4.05†		4.1875†		4.35†		4.575†

† These Velocities were with a Motive Weight of 134 lbs.

The beginning of the third experiment is not accurate, the pencil having marked irregularly.

WEDNESDAY, November 4, 1795.

Parallelopipedon i, with two square iron planes 7 feet $10\frac{1}{7}$ asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence, 40°.				
Total Wt. 410 lbs. 4 oz.		M. Wt. 134 lbs.		
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.0	5.0	5.4	5.4
4	12.2	7.2	12.4	7.0
6	20.2	8.0	20.4	8.0
8	28.7	8.5	28.8	8.4
10	37.4	8.7	37.6	8.8
12	46.2	8.8	46.4	8.8
14	55.1	8.9	55.3	8.9
16	64.0	8.9	64.2	8.9
18	72.9	8.9	73.2	9.0
20	82.0	9.1	82.3	9.1
22	91.0	9.0*	91.5	9.2*
24	100.2	9.2	100.8	9.3
26	109.2	9.0	109.8	9.0
28	118.4	9.2	119.1	9.3
		4)36.4		36.8
		2)9.1		9.2
		4.55		4.6
		4.60		
		2)9.15		
		4.575 Velocity with a Motive Wt. of 134 lbs.		

System Three-fold.

Angle of Incidence, 30°.		
T. W. lbs. oz. 410 4		M. W. lbs. 134
Accelerating Wt. none.		
Sec.	Feet.	Differences.
2	4.4	4.4
4	11.2	6.8
6	19.7	8.5
8	29.2	9.5
10	39.0	9.8
12	49.2	10.2
14	59.3	10.1
16	69.4	10.1
18	79.4	10.0
20	89.7	10.3
22	99.9	10.2
24	110.1	10.2
26	120.3	10.2*
		2)10.2
		Velocity with a M. Wt. of 134 lbs. . 5.1

WEDNESDAY, November 4, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angle of Incidence, 20°.				
Total Wt. 410 lbs. 4 oz. M. Wt. 134 lbs.				
Accel. Wt. 28 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	.....	.....	6.3	6.3
4	.....	.....	15.8	9.5
6	.....	.....	26.8	11.0
8	22.0	.....	39.0	12.2
10	33.4	11.4	51.4	12.4
12	45.6	12.2	64.1	12.7
14	58.1	12.5	76.7	12.6
16	70.8	12.7	89.6	12.9
18	83.6	12.8	102.6	13.0*
20	96.4	12.8	.....	.....
22	109.3	12.9	.....	.....
24	122.2	12.9*	.....	.....
		2)12.9		13.0
		6.45		6.5
		6.50		
		2)12.95		
		6.475 Velocity with a Motive Weight of 134 lbs.		

System Three-fold.

Angle of Incidence, 10°.		
	lbs. oz. T. W. 410 4	lbs. M. W. 134
Accelerating Wt. 56 lbs.		
Sec.	Feet.	Differences.
2	5.5	5.5
4	14.7	9.2
6	26.9	12.2
8	49.9	14.0
10	56.0	15.1
12	71.7	15.7
14	87.5	15.8
16	103.7	16.2*
18	119.8	16.1
		2)32.3
		2)16.15
		Velocity with a Motive Wt. of 134 lbs. . 8.075

THURSDAY, November 19, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

Thermometer in the Air, 43½°;—In the Dock, 44½°.—Wind, N. W. Moderate.

System Three-fold.

Angles of Incidence,	80°.		70°.		60°.	
Total Weight 102 lbs. 8 oz.			Motive Weight 33 lbs. 8 oz.			
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.2	4.2	3.9	3.9	4.6	4.6
8	9.9	5.7	9.5	5.6	10.6	6.0
12	16.5	6.6	16.2	6.7	17.5	6.9
16	23.5	7.0	23.3	7.1	24.9	7.4
20	39.8†	7.3	31.0	7.7	32.8	7.9
24	38.5	7.7	38.8	7.8	40.8	8.0
28	46.2	7.7	46.8	8.0	49.1	8.3
32	54.0	7.8	54.8	8.0	57.4	8.3
36	61.8	7.8	62.9	8.1	65.9	8.5
40	69.8	8.0	71.1	8.2	74.4	8.5
44	77.8	8.0	79.3	8.2	82.9	8.5
48	85.7	7.9	87.5	8.2	91.5	8.6
52	93.7	8.0	95.7	8.2	100.2	8.7
56	101.7	8.0	99.8	4.1	104.6	4.4
58	105.7	4.0	104.0	4.2	108.9	4.3
60	109.7	4.0	108.1	4.1	113.3	4.4
62	113.6	3.9	112.2	4.1	117.7	4.4*
64	117.6	4.0	116.4	4.2	122.1	4.4
66	121.6	4.0	120.5	4.1*	126.4	4.3
68	125.6	4.0*	124.7	4.2	.....	.....
70	.....	.....	128.8	4.1	.....	.....
		2)4.0		3)12.4		13.1
		2.0‡		4.1333		4.3666
				2.0666‡		2.1833‡

† Query 30.8?

‡ These Velocities were with a Motive Weight of 33 lbs. 8 oz.

THURSDAY, November 19, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angles of Incidence. 50°.			40°.		30°.	
Total Weight 102 lbs. 8 oz.			Motive Weight 33 lbs. 8 oz.			
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.2	4.2	4.0	4.0	4.4	4.4
8	10.3	6.1	10.2	6.2	11.5	7.1
12	17.5	7.2	17.9	7.7	20.2	8.7
16	25.1	7.6	26.2	8.3	29.7	9.5
20	33.2	8.1	34.7	8.5	39.7	10.0
24	41.5	8.3	43.5	8.8	49.8	10.1
28	50.2	8.7	52.4	8.9	60.1	10.3
32	58.9	8.7	61.4	9.0	70.5	10.4
36	67.9	9.0	70.5	9.1	80.9	10.4
40	76.9	9.0	79.5	9.0	91.4	10.5
44	86.1	9.2	88.7	9.2	96.6	5.2
48	95.3	9.2	98.0	9.3	101.9	5.3
50	100.0	4.7	102.8	4.8	107.1	5.2
52	104.7	4.7	107.5	4.7	112.3	5.2
54	109.3	4.6	112.2	4.7	117.5	5.2*
56	114.0	4.7	116.9	4.7	122.8	5.3
58	118.6	4.6*	121.7	4.8*	128.0	5.2
60	123.2	4.6	126.5	4.8	.....	.....
62	127.9	4.7	131.3	4.8	.....	.....
		3)13.9		14.4		15.7
		2)4.6333		4.8		5.2333
		2.3166†		2.4†		2.6166†

† These Velocities were with a Motive Weight of 33 lbs. 8 oz.

THURSDAY, November 19, 1795.

Parallelopipedon i, with two square iron planes 7 feet 10½ inches asunder, the centre of each plane being immersed three feet below the surface of the water.

System Three-fold.

Angles of Incidence, 20°.			10°.	
T. Wt. 102 lbs. 8 oz.			M. Wt. 33 lbs. 8 oz.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.8	4.8	3.7	3.7
8	12.6	7.8	11.1	7.4
12	22.5	9.9	21.2	10.1
16	33.9	11.4	33.6	12.4
20	45.9	12.0	47.6	14.0
24	58.6	12.7	62.8	15.2
28	71.6	13.0	78.8	16.0
32	84.6	13.0	87.0	8.2
36	97.8	13.2	95.3	8.3
38	104.6	6.8	103.7	8.4
40	111.3	6.7*	112.2	8.5*
42	117.9	6.6	120.7	8.5
44	124.6	6.7	129.2	8.5
		3)20.0		25.5
		2)6.666		8.5
		3.3333†		4.25†

† These Velocities were with a Motive Weight of 33 lbs. 8 oz.

Parallelopipedon i, with the bars alone, the planes being taken away; the bars being immersed three feet below the surface of the water.

	Motive Weights.		
	lbs. oz. 8 6	lbs. oz. 16 12	lbs. oz. 33 8
Velocity per Experiment	2.3437	3.2750	4.6750
	Feet per Second.		
		6	
Motive Weight	.....	55.303	.....
Powers	2.0716	2.0077	1.9475

3)5.0268

Mean. . 2.0089 = 8 lbs. 6 oz. and 33 lbs. 8 oz.

FRIDAY, November 20, 1795.

Parallelopipedon i, with the bars alone, the planes being taken away.

Thermometer in the Air, 38½°.—In the Dock, 44°.—Wind, North, Light Airs.

System Three-fold.

Total Wt. 26 lbs. Motive Wt. 8 lbs. 6 oz.				
Accelerating Wt. 14 lbs.			Accel. Wt. 14lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.5	2.5	2.5	2.5
8	6.2	3.7	6.4	3.9
12	11.4	5.2	11.6	5.2
16	17.6	6.2	18.0	6.4
20	24.8	7.2	25.3	7.3
24	32.9	7.1	33.4	8.1
28	41.3	8.4	41.9	8.5
32	50.2	8.9	50.6	8.7
36	59.0	8.8	59.5	8.9
40	67.9	8.9	68.5	9.0
44	76.8	8.9	77.7	9.2
48	86.0	9.2	86.8	9.1
50	90.5	4.5	91.5	4.7
52	95.1	4.6	96.1	4.6
54	99.7	4.6	100.9	4.8
56	104.3	4.6	105.5	4.6
58	108.9	4.6	110.2	4.7
60	113.5	4.6	114.9	4.7
62	118.2	4.7*	119.6	4.7*
64	122.9	4.7	124.3	4.7
66	127.5	4.6	129.0	4.7
68	132.2	4.7	.....	.....
		4)18.7		3)14.1
		2)4.675		4.7
		2.3375		2.35
		2.3500		
		2)4.6875		
		2.3437	Velocity with a Motive Wt. of 8 lbs. 6 oz.	

FRIDAY, November 20, 1795.

Parallelopipedon i, with the bars alone, the planes being taken away.

System Three-fold.

T. Wt. 51 lbs. 8 oz. M. Wt. 16 lbs. 12 oz.				
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.4	3.4	4.0	4.0
8	9.6	6.2	10.8	6.8
12	18.2	8.6	19.7	8.9
16	28.5	10.3	30.6	10.9
20	40.0	11.5	42.5	11.9
24	52.6	12.6	55.1	12.6
28	65.3	12.7	67.8	12.7
32	78.2	12.9	80.7	12.9
36	91.2	13.0	93.7	13.0
38	97.7	6.5	100.3	6.6
40	104.3	6.6	106.8	6.5
42	110.8	6.5*	113.3	6.5*
44	117.4	6.6	119.9	6.6
46	124.0	6.6	126.4	6.5
48	130.6	6.6	132.9	6.5
		4)26.3		26.1
		2)6.575		6.525
		3.2875		3.2625
		3.2625		
		2)6.5500		
		3.2750 Velocity with a M. Wt. of 16 lbs. 12 oz.		

System Three-fold.

T. Wt. 102 lbs. 8 oz. M. Wt. 33 lbs. 8 oz.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.5	2.5	3.8	3.8
4	6.4	3.9	9.0	5.2
6	11.7	5.3	15.4	6.4
8	18.1	6.4	22.7	7.3
10	25.5	7.4	31.0	8.3
12	33.4	7.9	39.0	8.0
14	41.8	8.4	47.8	8.8
16	50.6	8.8	56.6	8.8
18	59.5	8.9	65.7	9.1
20	68.5	9.0	74.7	9.0
22	77.6	9.1	83.9	9.2
24	86.7	9.1	93.1	9.2
26	95.9	9.2	102.4	9.3
28	105.2	9.3	111.7	9.3*
30	114.5	9.3*	121.1	9.4
32	123.9	9.4	130.4	9.3
34	133.3	9.4	.....	.....
		3)28.1		28.0
		2)9.3666		9.333
		4.6833		4.6666
		4.6667		
		2)9.3500		
		4.6750 Velocity with a Motive Wt. of 33 lbs. 3 oz.		

GENERAL TABLE, 1795, AT THE SURFACE.

	Page.	Feet per Second.												
		1	2	3	4	5	6	7	8	9	10	11	12	13.527
Parallelopipedon a	74	1.8983	7.5840	17.052	30.300	47.327	68.129	92.708	121.09	153.19	189.07	228.75	272.20	345.81
..... b	81	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
..... bc	87	1.2207	5.4117	12.932	23.991	38.749	57.326	79.836	106.36	136.98	171.78	210.81	254.14	328.72
..... db	93	0.7926	3.3972	7.9595	14.561	23.263	34.114	47.152	62.412	79.924	99.714	121.81	146.23	188.05
..... ebe	100	0.5297	2.5791	6.5096	12.555	20.899	31.690	45.037	61.092	79.986	101.74	126.48	154.27	202.81
..... bf	106	1.1517	5.1596	12.405	23.116	37.458	55.569	77.568	103.55	133.60	167.80	206.22	248.95	322.59
..... gb	112	0.5695	2.6527	6.5249	12.357	20.278	30.394	42.794	57.558	74.758	94.454	116.70	141.57	184.69
..... hbh	118	0.4045	2.0277	5.2064	10.164	17.078	26.096	37.348	50.947	67.000	85.608	106.85	130.81	172.83
..... iai	124	0.6645	3.0856	7.5766	14.329	23.490	35.181	49.501	66.539	86.375	109.08	134.72	163.37	213.00
..... bk	129	1.0874	4.8894	11.778	21.980	35.662	52.955	73.973	98.818	127.57	160.31	197.12	238.06	308.67
..... lb	134	0.4353	2.0668	5.1412	9.8133	16.204	24.411	34.518	46.598	60.720	76.943	95.322	115.91	151.71
..... mbm	139	0.3388	1.6479	4.1568	8.0144	13.334	20.214	28.736	38.974	50.991	64.849	80.599	98.300	129.20
..... bn	145	1.2359	5.2664	12.297	22.443	35.789	52.402	72.336	95.639	122.35	152.51	186.15	223.30	286.86
..... ob	151	0.6150	2.6045	6.0596	11.031	17.556	25.663	35.375	46.716	59.702	74.349	90.672	108.69	139.48
..... pbp	155	0.4927	2.0735	4.8073	8.7298	13.866	20.239	27.862	36.752	46.919	58.376	71.133	85.199	109.23
..... qaq	159	0.7413	3.0214	6.8732	12.315	19.360	28.016	38.290	50.193	63.729	78.903	95.718	114.18	145.56
Triangle r Base foremost ...	163	3.3435	14.564	34.441	63.433	101.87	150.01	.....	.....	.....	.....	.....	.....	. ...
..... r Vertex foremost .	167	1.5992	6.2912	14.017	24.747	38.461	55.140	.....	.....	.....	.....	.....	.....	.....
..... t Base foremost ...	170	3.0905	13.807	33.139	61.684	99.873	148.06	.....	.....	.....	.....	.....	.....	.....
..... t Vertex foremost..	175	0.9632	4.4353	10.837	20.426	33.396	49.905	70.088	94.062	121.93	.....	.....	.....	.....
..... v Base foremost ...	180	3.2695	14.295	33.883	62.502†	100.50	148.15	.....	.....	.....	.....	.....	.....	.....
..... v Vertex foremost .	183	.....	3.5698	9.4442	18.836	32.176	49.836	72.145	99.399	.....	.....	.....	.....	.. ...

† Query 66.502 ?

GENERAL TABLE, 1795, UNDER THE SURFACE.

	Page.	Feet per Second.												
		1	2	3	4	5	6	7	8	9	10	11	12	13.527
Parallelopipedon p with b..	187	1.4453	6.119	14.165	25.649	40.613	59.08	81.08	106.64	135.76	168.45	204.75	244.62	312.53
..... k..	192	1.5034	6.074	13.712	24.412	38.168	54.97	74.82	97.71	123.63	152.58	184.54	219.54	278.81
..... l..	201	0.7105	3.1380	7.404	13.568	21.662	31.714	43.74	57.76	73.78	91.82	111.89	133.98	171.68
..... m..	209	0.7610	2.9399	6.475	11.333	17.493	24.937	33.65	43.62	54.83	67.29	80.97	95.87	121.00
..... bw.	217	0.6674	2.9012	6.793	12.383	19.697	28.748	39.55	52.12	66.47	82.59	100.50	120.18	153.75
..... xb.	225	0.8814	3.4128	7.527	13.188	20.368	29.053	39.22	50.86	63.96	78.52	94.52	111.94	141.32
Parallelopipedon p and Bars	231	1.6627	6.0799	12.981	22.233	33.750	47.466	63.331	81.298	101.34	123.41	147.50	173.57	217.15
Friction Plank.....	239	2.0719	7.6736	16.502	28.412	43.304	61.105	81.758	105.21	131.42	160.36	191.99	226.28	283.72
Fore end of Friction Plank	245	1.8795	6.9511	14.940	25.708	39.169	55.250	73.902	95.079	118.74	144.86	173.40	204.34	256.16
Square Iron Plane, 3 feet..	252	3.2580	13.219	29.945	53.458	83.77	120.87	164.78	215.47	272.97	337.21	408.30	486.12	618.01
..... 6 feet..	258	3.3260	13.475	30.535	54.545	85.53	123.50	168.49	220.50	279.53	345.62	418.74	498.94	634.95
..... 9 feet..	267	3.5925	14.314	32.130	57.017	88.96	127.94	173.96	227.00	287.03	354.09	428.14	509.19	646.36
Bar 2 feet 4.686 inches....	280	0.7781	3.5499	8.6265	16.197	26.402	39.357	55.160	73.896	95.639	120.46	148.41	179.56	233.42
...5 feet 4.686 inches....	286	1.1939	5.1416	12.078	22.138	35.424	52.009	71.961	95.335	122.18	152.54	186.45	223.96	288.27
...8 feet 4.686 inches....	295	1.7010	7.0451	16.178	29.178	46.104	67.000	91.902	120.84	153.85	190.95	232.15	277.49	354.73

	Page.	Angles of Incidence.								
		90°	80°	70°	60°	50°	40°	30°	20°	10°
		Feet per Second.								
		6	6	6	6	6	6	6	6	6
Parallel. i, Planes outwards.	300	255.88	234.21	216.39	211.77	184.70	148.10	177.57	82.25	69.60
..... inwards..	312	.....	234.77	216.17	200.54	177.22	184.67	132.51	59.00	15.249
..... Bars only.....	319	.....	.....	.....	.....	55.303	.....	.....	.....	.....

323

A TABLE CONTAINING THE DIMINUTION OF THE PLUS AND MINUS PRESSURES AT THE SURFACE.

	Page.	Feet per Second.												
		1	2	3	4	5	6	7	8	9	10	11	12	13.527
Parallelopipedon b	87	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Minus Pressure bc.....	87	0.0644	0.2249	0.453	0.732	1.046	1.384	1.730	2.09	2.43	2.77	3.12	3.37	3.75
..... bf.....	106	0.1334	0.4770	0.980	1.607	2.337	3.141	3.998	4.900	5.810	6.750	7.710	8.56	9.88
..... bk.....	129	0.1977	0.7472	1.607	2.743	4.133	5.755	7.593	9.632	11.840	14.24	16.81	19.45	23.86
..... bn.....	145	0.0492	0.3702	1.088	2.280	4.006	6.308	9.230	12.811	17.06	22.04	27.78	34.21	45.61
Parallelopipedon b	87	1.2851	5.6366	13.385	24.723	39.795	58.710	81.566	108.45	139.41	174.55	213.93	257.51	332.47
Plus Pressure.. db	93	0.4925	2.2394	5.4261	10.162	16.532	22.596	34.414	46.04	59.49	74.84	92.12	111.28	144.42
..... gb.....	112	0.7156	2.9839	6.860	12.366	19.517	28.316	38.772	50.892	64.652	80.096	97.23	115.94	147.78
..... lb.....	134	0.8498	3.5698	8.244	14.910	23.591	34.299	47.048	61.852	78.690	97.607	118.60	141.60	180.76
..... ob	151	0.6701	3.0321	7.325	13.692	22.239	33.047	46.191	61.734	79.71	100.20	123.26	148.82	192.9

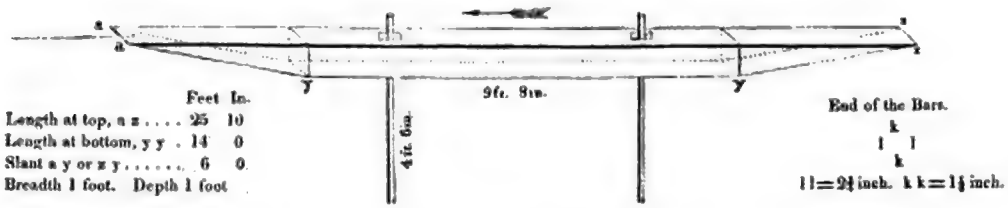
END OF THE FIRST SERIES.

NAUTICAL

EXPERIMENTS.

THE SECOND SERIES.

Conductor with angular bars, immersed 5 feet 6 inches.



	Feet	In.
Length at top, a x	25	10
Length at bottom, y y .	14	0
Slant a y or x y	6	0

Breadth 1 foot. Depth 1 foot

End of the Bars.

k
l l
k

l l = 2¼ inch. k k = 1½ inch.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.	.....	2.7513	4.1911	.....	7.655	.....	9.8900	10.974	.....	.....	.....
Correction for Line	.....	2.7653	4.2125	.....	7.7017	.....	9.9583	11.041	.....	.....	.....
Hutt. Cor. or Reg. Series.	2.0591	2.9698	4.2836	6.1785	7.6547	8.9116	10.027	11.041	12.783	14.398	15.867

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.	0.7647	2.8392	6.1157	10.541	16.080	22.705	30.397	39.134	48.904	59.695	71.495	84.292	105.74

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.		lbs.		lbs.	
6 and 12	1.6468									
36	1.7448	12..36	1.8207							
48	1.7681	48	1.8353	36..48	2.1781					
60	1.7937	60	2.0768	60	1.9940	48..60	2.1393			
72	1.7949	72	1.8595	72	2.0363	72	1.9463	60..72	1.7529	

15) 28.3855

Mean 12 lbs. and 72 lbs. 1.8924

FRIDAY, September 23, 1796.

Conductor with angular bars, immersed 5 feet 6 inches.

Thermometer in the Air, 54°;—In the Dock, 63°.—Water in Dock, 12 feet 9 inches.—Wind, N. N. W. Light Airs.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.75	2.75	2.50	2.50	5.78	5.78
8	8.42	5.67	7.87	5.37	12.60	6.82
12	16.17	7.75	15.35	7.48	21.18	8.58
16	25.27	9.10	24.30	8.95	30.87	9.69
20	35.30	10.03	34.43	10.13	41.43	10.56
24	45.89	10.59	44.92	10.49	52.37	10.94
28	56.53	10.64	55.61	10.69	63.32	10.95
32	67.20	10.67	66.38	10.77	74.17	10.85
36	77.87	10.67	77.17	10.79	84.89	10.72
40	88.61	10.74	87.98	10.81	95.63	10.74
44	99.41	10.80	98.76	10.78	106.45	10.82*
48	110.25	10.84*	109.60	10.84*	117.30	10.85
52	120.97	10.72	120.40	10.80	.....	.....
			131.30	10.90	.....	.....
			142.17	10.87	.....	.....
		2)21.56		43.41		2)21.67
		4)10.78		10.8525		10.835
		2.695		2.7131		2.70875

MONDAY, September 26, 1796.

Conductor with angular bars, immersed 5 feet 6 inches.

Thermometer in the Air, 68°;—In the Dock, 61°.—Water in the Dock, 12 feet 7 inches.—Wind, E. N. E. Moderate.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.77	4.77	4.03	4.03	5.08	5.08
8	11.22	6.45	10.11	6.08	11.72	6.64
12	19.49	8.27	18.08	7.97	20.17	8.45
16	29.10	9.61	27.37	9.29	29.80	9.63
20	39.60	10.50	37.66	10.29	40.09	10.29
24	50.36	10.76	48.28	10.62	50.80	10.71
28	61.22	10.86	59.03	10.75	61.68	10.88
32	72.13	10.91	69.91	10.88	72.50	10.82
36	83.11	10.98	80.80	10.89	83.43	10.93
40	94.17	11.06	91.73	10.93	94.39	10.96
44	105.19	11.02	102.73	11.00	105.30	10.91
48	116.33	11.14	113.88	11.15	116.31	11.01
52	127.48	11.15*	125.01	11.13*	127.42	11.11*
56	138.79	11.31	136.23	11.22	138.63	11.21
60	150.00	11.21	147.38	11.15	149.83	11.20
		3)33.67		33.50		33.52
		4)11.2233		11.1666		11.1733
		2.8058		2.79160		2.7933
				2.80580		
				2.79340		
				2.70875		
				2.71310		
				2.69500		
				6)16.50765		
				2.75127 Velocity with a Motive Wt. of 6 lbs.		

MONDAY, September 26, 1796.

Conductor with angular bars, immersed 5 feet 6 inches.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.40	2.40	4.93	4.93	6.47	6.47
8	10.76	8.36	14.79	9.86	17.24	11.77
12	22.78	12.02	27.78	12.99	30.73	13.49
16	37.31	14.53	42.59	14.81	45.84	15.11
20	53.02	15.71	58.63	16.04	61.79	15.95
24	69.50	16.48	74.80	16.07	77.99	16.20
28	85.70	16.20	90.78	15.98	94.10	16.11
32	101.89	16.19	106.80	16.02	110.13	16.03
34	109.80	7.91	114.81	8.01	118.21	8.08
36	117.97	8.17	122.89	8.08	126.27	8.06
38	126.16	8.19	130.93	8.04	134.38	8.11
40	134.31	8.15	139.18	8.25	143.65	8.27
42	142.60	8.29	147.31	8.13	150.88	8.23
44	150.83	8.23	155.70	8.39	159.10	8.22*
46	159.23	8.40*	164.00	8.30*	167.52	8.42
48	167.71	8.48	172.41	8.41	175.83	8.31
50	176.12	8.41	180.90	8.49	.....	.....
		3)25.29		25.20		24.95
		2)8.43		8.400		8.3166
		4.2150		4.200		4.1583
		4.2000				
		4.1583				
		3)12.5733				
		4.1911 Velocity with a Motive Wt. of 12 lbs.				

SATURDAY, September 24, 1796.

Conductor with angular bars, immersed 5 feet 6 inches.

Thermometer in the Air, 59°;—In the Dock, 63°.—Water in the Dock, 12 feet 10 inches.—Wind, Northerly, Light Airs.

System Four-fold.

Total Wt. 147 lbs. 14 oz.			M. Wt. 36 lbs.	
Accelerating Wt. 42 lbs.			Accel. Wt. 42 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.01	4.01	5.29	5.29
4	11.93	7.92	14.06	8.77
6	22.45	10.52	25.10	11.04
8	34.90	12.45	37.94	12.84
10	48.73	13.83	52.23	14.29
12	62.88	14.15	66.80	14.57
14	77.23	14.35	81.78	14.98
16	91.80	14.57	96.60	14.82
18	106.51	14.71	111.50	14.90
20	121.33	14.82	126.55	15.05
22	136.52	15.19	141.78	15.23
24	151.70	15.18*	157.01	15.23*
26	167.06	15.36	172.48	15.47
		2)30.54		30.70
		2)15.27		15.35
		7.635		7.675
		7.675		
		2)15.310		
		7.655 Velocity with a Motive Weight of 36 lbs.		

SATURDAY, September 24, 1796.

Conductor with angular bars, immersed 5 feet 6 inches.

System Four-fold.

Total Weight 190 lbs. 10 oz. Motive Weight 48 lbs.								
Accelerating Wt. 56 lbs.			Accel. Wt. 70 lbs.		Accel. Wt. 70 lbs.		Accel. Wt. 70 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.22	6.22	5.68	5.68	4.51	4.51	7.49	7.49
4	17.01	10.79	16.68	11.00	14.69	10.18	19.57	12.08
6	31.29	14.28	31.30	14.62	28.81	14.12	34.88	15.31
8	47.44	16.15	48.18	16.88	45.17	16.36	52.01	17.13
10	64.76	17.32	66.00	17.82	62.77	17.60	69.74	17.73
12	82.18	17.42	83.98	17.98	80.69	17.92	87.42	17.68
14	99.68	17.50	101.67	17.69	98.27	17.58	105.17	17.75
16	117.08	17.40	119.60	17.93	115.74	17.47	122.97	17.80
18	134.83	17.75	137.70	18.10*	133.53	17.79	140.70	17.73*
20	152.67	17.84*	155.62	17.92	151.40	17.87*	158.66	17.96
22	170.50	17.83	.....	.....	169.39	17.99	.....	.....
		2)35.67		36.02		35.86		35.69
		2)17.835		18.01		17.93		17.845
		8.9175		9.005		8.965		8.9225

MONDAY, September 26, 1796.

Conductor with angular bars, immersed 5 feet 6 inches.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.								
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	10.54	10.54	2.10	2.10	6.31	6.31	2.60	2.60
4	22.73	12.19	10.04	7.94	17.02	10.71	10.72	8.12
6	37.82	15.09	21.97	11.93	31.20	14.18	23.01	12.29
8	54.78	16.96	36.60	14.63	47.59	16.39	38.10	15.09
10	72.03	17.25	53.19	16.59	64.94	17.35	55.18	17.08
12	89.38	17.35	70.32	17.13	82.41	17.47	72.48	17.30
14	106.92	17.54	87.89	17.57	100.13	17.72	89.91	17.43
16	124.51	17.59	105.25	17.36	117.95	17.82	107.64	17.73
18	142.40	17.89	122.80	17.55	135.60	17.65	125.31	17.67
20	160.00	17.60*	146.47	17.67	153.40	17.80*	143.23	17.92
22	177.70	17.70	158.25	17.78*	171.29	17.89	160.96	17.73*
24	.....	.....	175.83	17.58	.....	.....	178.77	17.81
		2)35.30		35.36		35.69		35.54
		2)17.65		17.68		17.845		17.77
		8.8250		8.84		8.9225		8.885
		8.8400						
		8.9225						
		8.8850						
		8.9175						
		9.0050						
		8.9650						
		8.9225						
		8)71.2825						
		8.9103 Velocity with a Motive Weight of 48 lbs.						

MONDAY, September 26, 1796.

Conductor with angular bars, immersed 5 feet 6 inches.

System Four-fold.

Total Wt. 245 lbs. Motive Wt. 60 lbs.				
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.78	7.78	7.88	7.88
4	20.15	12.37	20.90	13.02
6	36.51	16.36	37.42	16.52
8	55.20	18.69	55.90	18.48
10	74.39	19.19	75.04	19.14
12	93.70	19.31	94.51	19.47
14	113.32	19.62	114.20	19.69
16	132.93	19.61	133.81	19.61
18	152.79	19.86*	153.59	19.78*
20	172.49	19.70	173.37	19.78
		2)39.56		39.56
		2)19.78		19.78
		9.89		9.89
		9.89		
		2)19.78		
		9.89 Velocity with a Motive Weight of 60 lbs.		

MONDAY, September 26, 1796.

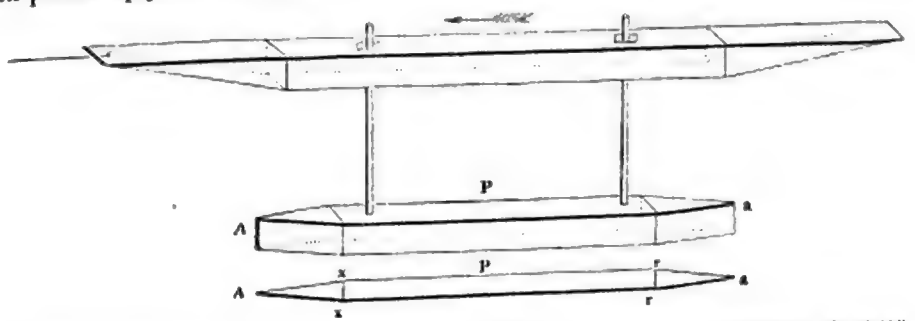
Conductor with angular bars, immersed 5 feet 6 inches.

System Fourfold.

Total Weight 293 lbs. 6 oz. Motive Weight 72 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.00	7.00	9.42	9.42	3.10	3.10
4	20.38	13.38	24.00	14.58	13.70	10.60
6	38.28	17.90	42.59	18.59	29.97	16.27
8	58.70	20.42	62.98	20.39	49.01	20.04†
10	79.80	21.10	84.37	21.49	70.10	21.09
12	101.44	21.64	105.82	21.45	91.51	21.41
14	123.28	21.84	127.70	21.88	113.39	21.88
16	145.39	22.11*	149.46	21.76*	135.09	21.70
18	167.30	21.91	171.56	22.10	157.20	22.11*
20	.....	.....	.....	.....	178.90	21.70
		2)44.02		43.86		43.81
		2)22.01		21.93		21.905
		11.0050		10.965		10.9525
		10.9650				
		10.9525				
		3)32.9225				
		10.9741 Velocity with a Motive Weight of 72 lbs.				

† Query 19.04?

Conductor with parallelopipedon P, with the ends Aa, the centre of the lower body being immersed six feet.



Parallelopipedon P, 10 feet. x A, r a, each=3 feet. ∠ of incidence, 9° 35′ 38″.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	2.2753	3.2994	4.7055	5.7717	6.7638	7.6758	8.4850	.....	.....	.....
Correction for Line	.....	2.2808	3.3162	4.7295	5.8069	6.8051	7.7227	8.5574	.....	.....	.....
Hutt. Correction, or Regular Series	1.5568	2.2550	3.2665	4.7317	5.8771	6.8543	7.7227	8.5134	9.8732	11.137	12.286

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3110	4.7937	10.234	17.528	26.608	37.420	49.927	64.092	79.889	97.291	116.28	136.83	171.20
Conductor and Bars	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.134	48.904	59.695	71.49	84.29	105.74
Resistance and Friction....	0.5463	1.9545	4.118	6.987	10.528	14.715	19.530	24.958	30.985	37.596	44.79	52.54	65.46
Friction on 45.916 feet ...	0.1706	0.6562	1.4395	2.2373	3.8699	5.060†	7.4171	9.9592	12.047	14.763	17.738	20.976	26.422
Plus and Minus Pressure..	0.3757	1.2983	2.6785	4.7497	6.6581	9.209	12.1129	15.359	18.938	22.833	27.052	31.564	39.038
Plus Pressure, 1798	0.2101	0.8624	1.944	3.432	5.308	7.549	10.136	13.056	16.284	19.810	23.61	27.68	34.34
Minus Pressure	0.1656	0.4359	0.7345	1.3177	1.3501	1.660	1.9779‡	2.303	2.654	3.023	3.442	3.884	4.698

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
6 and	12	1.8519	12..24	1.9526	24..36	1.9756	36..48	1.8136	48..60	1.7641	60..72	1.7764	
	24	1.9009	36	1.9610	48	1.9050	60	1.7917	72	1.7696			
	36	1.9173	48	1.9285	60	1.8687	72	1.7876					
	48	1.9022	60	1.9039	72	1.8527							
	60	1.8880	72	1.8901									
	72	1.8793											

21)39.2807

Mean 24 lbs. and 60 lbs. . . 1.8765

† Query 5.506 ?

‡ Query 1.9769 ?

SATURDAY, August 27, 1796.

Conductor with parallelopipedon P, with the ends A a, the centre of the lower body being immersed six feet.

Thermometer in the Air, 67°;—In the Dock, 69°.—Water in the Dock, 11 ft. 6 in.—Wind, W.N.W. Fresh Breeze.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.00	3.00	1.21	1.21	1.33	1.33
8	6.99	3.99	4.22	3.01	4.79	3.46
12	12.39	5.40	8.90	4.68	9.69	4.90
16	18.96	6.57	14.79	5.89	15.72	6.03
20	26.27	7.31	21.76	6.97	22.89	7.17
24	34.48	8.21	29.46	7.70	30.70	7.81
28	43.14	8.66	37.81	7.35	39.15	8.45
32	52.19	9.05	46.62	8.81	48.07	8.92
36	61.41	9.22	55.86	9.24	57.27	9.20
40	70.74	9.33	65.00	9.14	66.47	9.20
44	79.90	9.16	74.30	9.30	75.75	9.28
48	89.20	9.30	83.50	9.20	84.84	9.09
52	98.41	9.21	92.60	9.10	94.00	9.16
56	107.61	9.20	100.78	9.18	103.10	9.10
60	116.74	9.13	110.97	9.19	112.28	9.18
64	125.91	9.17	120.10	9.13	121.42	9.14
68	134.99	9.08	129.26	9.16	130.58	9.16
72	144.10	9.11*	138.39	9.13	139.60	9.02*
76	153.29	9.19	147.42	9.03*	148.69	9.09
80	162.41	9.12	156.53	9.11	157.80	9.11
84	.....	.....	165.66	9.13	.....	.....
		3)27.42		27.27		27.22
		4)9.14		9.09		9.0733
		2.2850		2.2725		2.2683
		2.2725				
		2.2683				
		3)6.8258				
		2.2753 Velocity with a Motive Wt. of 6 lbs.				

SATURDAY, August 27, 1796.

Conductor, parallelopipedon P, with the ends A a, &c.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.16	2.16	3.60	3.60	2.42	2.42
8	7.78	5.62	10.18	6.58	8.30	5.88
12	16.13	8.35	19.17	8.99	16.83	8.53
16	26.50	10.37	29.95	10.78	27.21	10.38
20	38.23	11.73	42.08	12.13	39.01	11.80
24	50.90	12.67	55.01	12.93	51.85	12.84
28	64.36	13.46	68.30	13.29	65.40	13.55
32	77.61	13.25	81.67	13.37	78.53	13.13
36	90.80	13.19	94.86	13.19	91.80	13.27
40	103.97	13.17	107.99	13.13	105.00	13.20
44	117.00	13.03	121.00	13.01	118.20	13.20
48	130.07	13.07	134.09	13.09	131.38	13.18
52	143.17	13.10	140.50	6.41	144.12	12.74
54	149.75	6.58	147.05	6.55	150.75	6.63
56	156.24	6.49	153.60	6.55	157.48	6.73*
58	162.81	6.57*	160.21	6.61*	164.05	6.57
60	169.37	6.56	166.78	6.57	170.66	6.61
62	175.87	6.50	173.45	6.67	.....	.....
		3)19.63		19.85		19.91
		2)6.5433		6.6166		6.6366
		3.2716		3.3083		3.3183
		3.3083				
		3.3183				
		3)9.8982				
		3.2994 Velocity with a Motive Wt. of 12 lbs.				

SATURDAY, August 27, 1796.

Conductor, with parallelopipedon P, with the ends A a, &c.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Weight 24 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.20	3.20	2.43	2.43	3.43	3.43
8	12.84	9.64	11.61	9.18	13.47	10.04
12	27.30	14.46	25.60	13.99	28.04	14.57
16	44.17	16.87	42.48	16.88	45.13	17.09
20	61.87	17.70	60.20	17.72	63.00	17.87
24	79.97	18.10	78.44	18.24	81.17	18.17
28	98.40	18.43	96.81	18.37	99.51	18.34
32	116.90	18.50	115.53	18.72	118.09	18.58
34	126.25	9.35	124.94	9.41	127.41	9.32
36	135.63	9.38	134.32	9.38	136.78	9.37
38	144.90	9.27	143.77	9.45	146.13	9.35*
40	154.33	9.43*	153.17	9.40*	155.51	9.38
42	163.71	9.38	162.63	9.46	164.97	9.46
44	173.13	9.42	172.05	9.42	.....	.....
		3)28.23		28.28		28.19
		2)9.41		9.4266		9.3966
		4.7050		4.7133		4.6983
		4.7133				
		4.6983				
		3)14.1166				
		4.7055 Velocity with a Motive Weight of 24 lbs.				

SATURDAY, August 27, 1796.

Conductor, parallelopipedon P, with the ends A a, &c.

System Four-fold.

Total Wt. 147 lbs. 14 oz.			M. Wt. 36 lbs.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.50	4.50	3.40	3.40
8	17.48	12.98	15.30	11.90
12	36.00	18.52	33.30	18.00
16	57.75	21.75	54.58	21.28
20	80.40	22.65	77.13	22.55
24	103.20	22.80	99.80	22.67
26	114.68	11.48	111.12	11.32
28	126.14	11.46	122.58	11.46
30	137.33	11.19	133.99	11.41
32	149.00	11.67*	145.48	11.49*
34	160.50	11.50	156.97	11.49
36	172.00	11.50	168.58	11.61
		3)34.67		34.59
		2)11.5566		11.53
		5.7783		5.765
		5.7650		
		2)11.5433		
		5.7716 Velocity with a Motive Wt. of 36 lbs.		

FRIDAY, August 26, 1796.

Conductor, parallelopipedon P, with the ends A a, &c.

Thermometer in the Air, 72°;—In the Dock, 69°.—Water in the Dock, 11 ft. 8 in.—Wind, S. W. Moderate.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 42 lbs.		Accel. Wt. 42 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.81	1.81	1.79	1.79	1.52	1.52
4	6.79	4.98	6.70	4.91	6.27	4.75
6	14.34	7.55	14.52	7.82	14.00	7.73
8	23.80	9.46	24.30	9.78	23.72	9.72
10	34.89	11.09	35.72	11.42	35.12	11.40
12	46.91	12.02	48.00	12.28	47.39	12.27
14	59.36	12.45	60.89	12.89	60.21	12.82
16	72.29	12.93	74.00	13.11	73.40	13.19
18	85.38	13.09	87.20	13.20	86.61	13.21
20	98.59	13.21	100.48	13.28	99.81	13.20
22	111.99	13.40	113.85	13.37	113.23	13.42
24	125.30	13.31	127.39	13.54	126.63	13.40
26	138.73	13.43*	140.90	13.51*	140.19	13.56*
28	152.27	13.54	154.39	13.49	153.70	13.51
30	165.87	13.60	167.97	13.58	167.23	13.53
		3)40.57		40.58		40.60
		2)13.5233		13.5266		13.533
		6.7616		6.7633		6.7666
		6.7633				
		6.7666				
		3)20.2915				
		6.7638 Velocity with a Motive Weight of 48 lbs.				

FRIDAY, August 26, 1796.

Conductor, parallelopipedon P, with the ends A a, &c.

System Four-fold.

Total Weight 245 lbs. Motive Weight 60 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.08	3.08	2.00	2.00	1.80	1.80
4	9.70	6.62	7.80	5.80	7.50	5.70
6	19.35	9.65	16.67	8.87	16.27	8.77
8	30.82	11.47	27.80	10.13	27.38	11.11
10	43.98	13.16	40.58	12.78	40.00	12.62
12	57.96	13.98	54.39	13.81	53.80	13.80
14	72.45	14.49	68.73	14.34	68.12	14.32
16	87.22	14.77	83.45	14.72	82.80	14.68
18	102.29	15.07	98.47	15.02	97.63	14.83
20	117.50	15.21	113.59	15.12	112.70	15.07
22	132.93	15.43*	128.90	15.21	127.88	15.18
24	148.27	15.34	144.29	15.39*	143.17	15.29
26	.....	.....	159.60	15.31	158.40	15.23*
28	.....	.....	.....	.....	173.81	15.41
		2)30.77		30.70		30.64
		2)15.385		15.35		15.32
		7.6925		7.675		7.66
		7.6750				
		7.6600				
		3)23.0275				
		7.6758 Velocity with a Motive Weight of 60 lbs.				

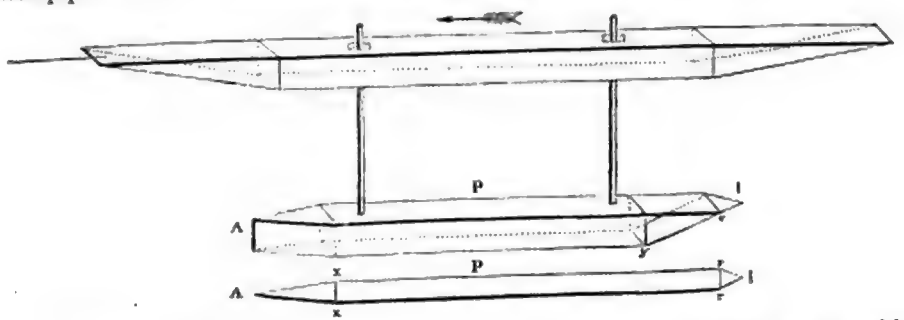
FRIDAY, August 26, 1796.

Conductor, parallelopipedon P, with the ends, A a, &c.

System Four-fold.

Total Wt. 293 lbs. 6 oz.			M. Wt. 72 lbs.	
Accel. Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.02	6.02	4.40	4.40
4	15.04	9.02	12.78	8.38
6	26.93	11.89	24.13	11.35
8	40.87	13.94	37.74	13.61
10	55.99	15.12	52.72	14.98
12	71.93	15.94	68.54	15.82
14	88.29	16.36	84.78	16.24
16	104.82	16.53	101.42	16.64
18	121.60	16.78	118.17	16.75
20	138.48	16.88	134.94	16.77
22	155.53	17.05*	151.90	16.96*
24	172.47	16.94	168.83	16.93
		2)33.99		33.89
		2)16.995		16.945
		8.4975		8.4725
		8.4725		
		2)16.9700		
		8.4850 Velocity with a Motive Weight of 72 lbs.		

Conductor, parallelopipedon P, with A fore and 1 after bodies, the centre of the lower body being immersed six feet.



∠ of incidence, 9° 35′ 40″. r A = 3 feet. r 1 = 1 foot. Slant, r y = 3 feet.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment	.....	.....	3.1508	4.5591	.....	6.595	.....	8.200	.....	.....	.....
Correction for Line	.....	.....	3.1669	4.5823	.....	6.6352	.....	8.268	.....	.....	.....
Hutt. Correction, or Regular Series	1.5053	2.1825	3.1646	4.5885	5.7023	6.6530	7.4983	8.2680	9.5924	10.823	11.943

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.3987	5.0977	10.862	18.578	28.171	39.585	52.776	67.707	84.347	102.67	122.65	144.26	180.39
Conductor and Bars	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.134	48.904	59.69	71.49	84.29	105.74
Resistance and Friction	0.6340	2.2585	4.746	8.037	12.091	16.880	22.379	28.573	35.443	42.98	51.16	59.97	74.65
Friction on 49.047	0.1823	0.7010	1.538	2.681	4.134	5.881	7.923	10.254	12.869	15.77	18.95	22.41	28.22
Plus and Minus Pressures	0.4517	1.5575	3.208	5.356	7.957	10.999	14.456	18.319	22.574	27.21	32.21	37.56	46.43
Plus Pressure 1798	0.2101	0.8624	1.944	3.432	5.308	7.549	10.136	13.056	16.284	19.81	23.61	27.68	34.34
Minus Pressure	0.2416	0.6951	1.264	1.924	2.649	3.450	4.320	5.263	6.290	7.40	8.60	9.88	12.09

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. 12 and	lbs. 24	1.8761	24..48	1.8724	48..72	1.8430		
	48	1.8743						
	72	1.8671	72	1.8614			6)	11.1943
							Mean 12 lbs. and 72 lbs.	1.8657

FRIDAY, September 16, 1796.

Conductor, parallelopipedon P, with A fore and 1 after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 69°;—In the Dock, 64°.—Water in the Dock, 11 feet 4 inches.—Wind, S. S. W. Moderate.

System Four-fold.

Total Wt. 49 lbs. 11 oz. 8 drs. M. Wt. 12 lbs.				
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.16	4.16	3.95	3.95
8	11.92	7.76	11.12	7.17
12	21.00	9.08	20.57	9.45
16	32.02	11.02	31.56	10.99
20	44.15	12.13	43.69	12.13
24	57.06	12.91	56.60	12.91
28	69.92	12.86	69.51	12.91
32	82.69	12.77	82.40	12.89
36	95.32	12.63	95.02	12.62
40	107.82	12.50	107.50	12.48
44	120.24	12.42	119.98	12.48
48	132.76	12.52	132.43	12.45
50	139.00	6.34	138.70	6.27
52	145.30	6.30*	145.01	6.31
54	151.60	6.30	151.30	6.29
56	157.89	6.29	157.61	6.31*
58	.....	.....	163.91	6.30
60	.....	.....	170.22	6.31
		3)18.89		18.92
		2)6.2966		6.3066
		3.1483		3.1533
		3.1533		
		2)6.3016		
		3.1508 Velocity with a Motive Wt. of 12 lbs.		

System Four-fold.

Total Wt. 99 lbs. 2 oz. Motive Wt. 24 lbs.				
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.20	7.20	7.95	7.95
8	19.68	12.48	21.08	13.13
12	35.70	16.02	37.40	16.32
16	53.63	17.93	55.35	17.95
20	71.89	18.16	73.87	18.52
24	90.00	18.11	92.21	18.34
28	108.20	18.20	110.51	18.30
32	126.40	18.20	128.70	18.19
34	135.60	9.20	137.78	9.08
36	144.69	9.09*	146.99	9.21*
38	153.81	9.12	156.04	9.05
40	162.91	9.10	165.18	9.14
		3)27.31		27.40
		2)9.1033		9.1333
		4.5516		4.5666
		4.5666		
		2)9.1182		
		4.5591 Velocity with a Motive Wt. of 24 lbs.		

THURSDAY, September 15, 1796.

Conductor, parallelopipedon P, with A fore and I after bodies, &c.

Thermometer in the Air, 74°;—In the Dock, 65°.—Water in the Dock, 11 feet 5 inches.—Wind, S. W. Fresh Breeze.

System Four-fold

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.

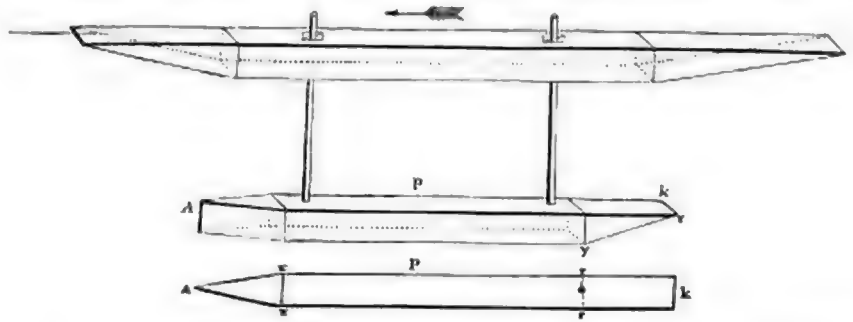
Accelerating Wt. 56 lbs.			A. Wt. 56 lbs.		A. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.04	2.04	1.75	1.75	3.55	3.55
4	4.78	2.74	7.22	5.47	10.25	6.70
6	11.80	7.02	15.17	7.95	19.32	9.07
8	21.30	9.50	25.30	10.13	30.23	10.91
10	32.29	10.99	37.00	11.70	42.48	12.25
12	44.08	11.79	49.75	12.75	55.39	12.91
14	57.45	13.37	62.65	12.90	68.61	13.22
16	70.69	13.24	75.92	13.27	81.81	13.20
18	83.81	13.12	89.05	13.13	94.98	13.17
20	97.00	13.19	102.20	13.15	108.25	13.27
22	111.19	13.19	115.40	13.20	121.30	13.65
24	123.43	13.24	128.53	13.13	134.60	13.30*
26	136.73	13.30*	141.65	13.12*	147.76	13.16
28	149.85	13.12	154.84	13.19	160.93	13.17
30	163.06	13.21	167.98	13.14	.....	.....
		3)39.63		39.45		39.63
		2)13.21		13.15		13.21
		6.605		6.575		6.605
		6.575				
		6.605				
		3)19.785				
		6.595 Velocity with a Motive Wt. of 48 lbs.				

System Four-fold.

T. W. lbs. 293 oz. 6	M. W. lbs. 72
Accelerating Wt. 56 lbs.	
Sec.	Feet.	Differences.
2	1.10	1.10
4	7.06	5.96
6	16.75	9.69
8	29.35	12.60
10	43.80	14.45
12	59.35	15.55
14	75.29	15.84
16	91.40	16.11
18	107.51	16.11
20	123.98	16.47
22	130.05†	16.07
24	156.45	16.40*
26	172.85	16.40
		2)32.80
		2)16.40
		Velocity with a M. Wt. of 72 lbs. . 8.20

† Query 140.05?

Conductor, parallelopipedon P, with A fore and k after bodies, the centre of the lower body being immersed six feet.



∠ of incidence, 9° 35′ 38″ — x A = 3 feet. k o = 2 feet 10 inches. Slant r y = 3 feet. — ∠ of incidence, 19° 28′ 16″

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	2.1971	3.1616	4.5289	.....	6.5925	.....	.....	.....	.....	.....
Correction for line.....	.....	2.2024	3.1777	4.5520	.....	6.6327	.....	.....	.....	.....	.....
Hutt. Correction, or Regular Series	1.5273	2.2030	3.1777	4.5837	5.6790	6.6117	7.4393	8.1917	9.4843	10.683	11.773

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3465*	4.9971	10.762	18.548	28.291	30.945†	53.473	68.845	86.031	105.01	125.76	148.77‡	185.99
Conductor and Bars.....	0.7647	2.8392	6.116	10.541	16.080	22.705	30.597§	39.134	48.904	59.69	71.49	84.29	105.74
Resistance and Friction....	0.5816	2.1579	4.646	8.007	12.211	17.240	23.076	29.711	37.127	45.32	54.27	63.98	80.25
Friction on 48.614 feet....	0.1806	0.6948	1.524	2.658	4.097	5.829	7.853	10.163	12.755	15.63	18.78	22.21	27.97
Plus and Minus Pressures..	0.4010	1.4631	3.122	5.349	8.114	11.411	15.223	19.548	24.372	29.69	25.49‖	41.77	52.28
Plus Pressure of 1798.....	0.2101	0.8624	1.944	3.432	5.308	7.549	10.136	13.056	16.284	19.81	23.61	27.68	34.34
Minus Pressure	0.1909	0.6007	1.178	1.917	2.806	3.862	5.087	6.492	8.088	9.88	11.88	14.09	17.94

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.						
6 and	12	1.8906					
	24	1.9094	12..24	1.9286			
	48	1.8862		48	1.8839	24..48	1.8537

6) 11.3524

Mean 6 lbs. and 12 lbs... 1.8921

* Query 1.3463? † Query 39.945? ‡ Query 148.27? § Should be 30.397? ‖ Query 35.49?

FRIDAY, September, 9, 1796.

Conductor, parallelopipedon P, with A fore and k after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 77°;—In the Dock, 63°.—Water in Dock, 12 feet 6 inches.—Calm.

System Four-fold.

Total Wt. 24 lbs. 12 oz. 1 dr.			M. Wt. 6 lbs.	
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	3.98	3.98	2.02	2.02
8	8.22	4.24	5.53	3.51
12	13.62	5.30†	10.62	5.09
16	19.91	6.31‡	16.62	6.00
20	26.99	7.08	23.40	6.78
24	34.59	7.60	30.91	7.51
28	42.60	8.01	38.81	7.90
32	50.75	8.15	46.90	8.09
36	59.09	8.34	55.20	8.30
40	67.50	8.41	63.60	8.40
44	76.00	8.50	72.10	8.50
48	84.50	8.50	80.57	8.50§
52	93.10	8.60	89.13	8.56
56	101.73	8.63	97.77	8.64
60	110.40	8.67	106.40	8.63
64	119.10	8.70	115.10	8.70
68	127.82	8.72	123.88	8.78
72	136.61	8.79*	132.60	8.72*
76	145.32	8.71	141.42	8.82
80	154.10	8.78	150.33	8.91
		3)26.28		26.45
		4)8.76		8.8166
		2.1900		2.2041
		2.2041		
		2)4.3941		
		2.1971	Velocity with a Motive Weight of 6 lbs.	

† Should be 5.40? ‡ Should be 6.29? § Should be 8.47?

SATURDAY, September 10, 1796.

Conductor, parallelopipedon P, with A fore and k after bodies, &c.

Thermometer in the Air, 78°;—In the Dock, 65°.—Water in the Dock, 11 feet 11 inches.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.53	4.53	3.93	3.93	5.73	5.73
8	11.84	7.31	10.84	6.91	13.48	7.75
12	21.39	9.55	20.10	9.26	23.11	9.63
16	32.48	11.09	30.88	10.78	34.32	11.21
20	44.52	12.04	42.79	11.91	46.52	12.20
24	57.28	12.76	55.43	12.64	59.13	12.61
28	70.02	12.74	68.15	12.72	71.99	12.86
32	82.70	12.68	80.79	12.64	84.51	12.52
36	95.27	12.57	93.26	12.47	96.98	12.47
40	107.79	12.52	105.70	12.44	109.46	12.48
44	120.32	12.53	118.12	12.42	121.92	12.46
48	132.92	12.60	130.63	12.51	134.43	12.51
50	139.19	6.27	143.17	12.54	140.70	6.27
52	145.57	6.38	149.41	6.24	147.00	6.30
54	151.80	6.23	155.80	6.39	153.29	6.29
56	158.20	6.40*	162.07	6.27	159.59	6.30
58	164.43	6.23	168.48	6.41*	165.90	6.31*
60	170.83	6.40	174.72	6.24	172.22	6.32
62	.....	.....	181.01	6.29	178.53	6.31
		3)19.03		18.94		18.94
		2)6.3433		6.3133		6.3133
		3.1716		3.1566		3.1566
		3.1566				
		3.1566				
		3)9.4848				
		3.1616 Velocity with a Motive Weight of 12 lbs.				

SATURDAY, September 10, 1796.

Conductor, parallelopipedon P, with A fore and k after bodies, &c.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Weight 24 lbs.

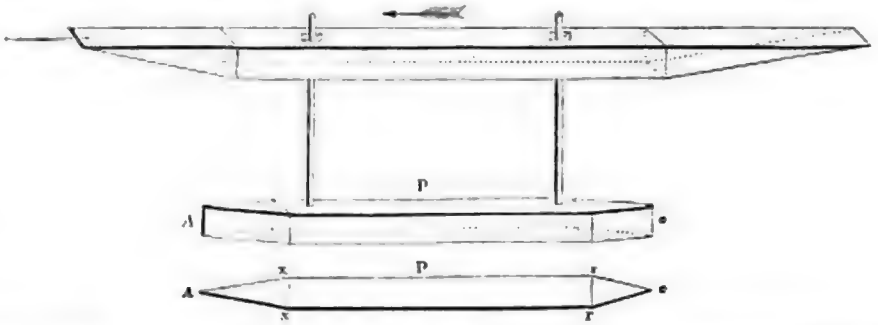
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.08	7.08	9.58	9.58	9.12	9.12
8	19.51	12.43	23.72	14.14	22.98	13.86
12	35.14	15.63	40.50	16.78	39.69	16.71
16	52.80	17.66	58.43	17.93	57.71	18.02
20	70.58	17.78	76.48	18.05	75.68	17.97
24	88.40	17.82	94.47	17.99	93.72	18.04
28	106.34	17.94	112.50	18.03	111.80	18.08
32	124.33	17.99	121.59	9.09	120.83	9.03
34	133.28	8.95	130.60	9.01	129.90	9.07
36	142.30	9.02	139.70	9.10	138.98	9.08
38	151.30	9.00*	148.76	9.06*	148.02	9.04*
40	160.30	9.00	157.82	9.06	157.05	9.03
42	169.39	9.09	166.91	9.09	166.20	9.15
		3)27.09		27.21		27.22
		2)9.03		9.07		9.0733
		4.5150		4.535		4.5366
		4.5350				
		4.5366				
		3)13.5866				
		4.5289 Velocity with a Motive Wt. of 24 lbs.				

System Four-fold.

T. W. lbs. 196 oz. 10	M. W. lbs. 48

Accelerating Wt. 28 lbs.		
Sec.	Feet.	Differences.
2	4.27	4.27
4	10.72	6.35
6	19.21	8.49
8	29.29	10.08
10	40.56	11.27
12	52.59	12.03
14	65.09	12.50
16	77.91	12.82
18	90.87	12.96
20	103.99	13.12
22	117.00	13.01
24	130.23	13.23
26	143.33	13.10
28	156.52	13.19*
30	169.70	13.18
		2)26.37
		2)13.185
		Velocity with a M. Wt. of 48 lbs. . 6.5925

Conductor, parallelopipedon P, with A fore and e after bodies, the centre of the lower body being ***immersed six feet.***



∠ of incidence, 9° 35′ 38″. A = 3 feet. re = 1 foot 6 inches. ∠ of incidence, 19° 28′ 16″.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	2.1994	3.1208	4.5211	5.5208	6.4572	.....	8.035	.....	.....	.....
Correction for Line.....	.....	2.2047	3.1367	4.5441	5.5545	6.4966	.....	8.1017	.....	.....	.....
Hutt. Correction, or Regular Series	1.5307	2.2015	3.1664	4.5541	5.6329	6.5501	7.3631	8.1017	9.3693	10.544	11.610

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3320	4.9963	10.826	18.739	28.680	40.605	54.485	70.286	87.989	107.57	129.01	152.30	191.39
Conductor and Bars.....	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.134	48.904	59.69	71.49	84.29	105.74
Resistance and Friction.....	0.5673	2.1571	4.710	8.198	12.600	17.900	24.088	31.152	39.085	47.88	57.52	68.01	85.65
Friction on 44.372 feet.....	0.1649	0.6342	1.391	2.426	3.740	5.321	7.168	9.276	11.642	14.27	17.14	20.27	25.53
Plus and Minus Pressures...	0.4024	1.5229	3.319	5.772	8.860	12.579	16.920	21.876	27.443	33.61	40.38	47.74	60.12
Plus Pressure, 1798.....	0.2101	0.8624	1.944	3.432	5.308	7.549	10.136	13.056	16.284	19.81	23.61	27.68	34.34
Minus Pressure.....	0.1923	0.6605	1.375	2.340	3.552	5.030	6.784	8.820	11.159	13.80	16.77	20.06	25.78

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
6 and	12	1.9660											
	24	1.9168	12..24	1.8701									
	36	1.9391	36	1.9226	24..36	2.0194							
	48	1.9242	48	1.9040	48	1.9391	36..48	1.8363					
	72	1.9093	72	1.8883	72	1.8999	72	1.8363	48..72	1.8364			

15)28.6078

Mean 6 lbs. and 72 lbs. . 1.9072

If the power for calculating the Regular Series be reduced from 1.9072 to 1.8500, it will require only 185.86 to produce a velocity of eight nautical miles per hour.

WEDNESDAY, September 7, 1796.

Conductor, parallelopipedon P, with A fore and e after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 70°;—In the Dock, 62°.—Water in the Dock, 12 feet 3 inches.—Calm.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	1.70	1.70	1.80	1.80	1.94	1.94
8	5.43	3.73	5.60	3.80	5.71	3.77
12	11.07	5.64	10.99	5.39	10.95	5.24
16	17.70	6.53	17.30	6.31	17.27	6.32
20	25.15	7.45	24.67	7.37	24.49	7.22
24	33.38	8.23	32.66	7.99	32.55	8.06
28	41.96	8.58	41.13	8.47	40.94	8.39
32	50.68	8.72	49.90	8.77	49.80	8.86
36	69.69	9.01	58.68	8.78	58.67	8.87
40	68.58	8.89	67.55	8.87	67.53	8.86
44	77.39	8.81	76.39	8.84	76.44	8.91
48	86.24	8.85	85.07	8.68	85.31	8.87
52	94.94	8.70	93.82	8.75	94.09	8.78
56	103.65	8.71	102.50	8.68	102.92	8.83
60	112.40	8.75	111.28	8.78	111.68	8.76
64	121.11	8.71	120.10	8.82	120.50	8.82
68	129.91	8.80	128.85	8.75	129.35	8.85
72	138.73	8.82*	137.63	8.78*	138.18	8.83*
76	147.43	8.70	146.42	8.79	146.94	8.76
80	156.28	8.85	155.18	8.76	155.83	8.89
		3)26.37		26.33		26.48
		4)8.79		8.7766		8.8266
		2.1975		2.1941		2.2066
		2.1941				
		2.2066				
		3)6.5982				
		2.1994 Velocity with a Motive Weight of 6 lbs.				

MONDAY, November 28, 1796.

Conductor, parallelopipedon P, with A fore and e after bodies, &c.

Water in the Dock, 12 feet 9 inches.—Wind, North, Fresh Breeze.

System Four-fold.

T. Wt. 49 lbs. 11 oz. 8 drs.			M. Wt. 12 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	1.26	1.26	2.60	2.60
8	6.65	5.39	7.91	5.31
12	14.15	7.50	15.33	7.42
16	23.14	8.99	24.18	8.85
20	33.10	9.96	34.10	9.92
24	43.80	10.70	44.75	10.65
28	55.02	11.22	55.95	11.20
32	65.53	11.51	67.47	11.52
36	78.45	11.92	79.30	11.83
40	90.43	11.98	91.25	11.95
44	102.53	12.10	103.34	12.09
48	114.75	12.22	115.51	12.17
52	127.05	12.30	127.82	12.31
56	139.46	12.41	140.16	12.34
58	145.69	6.23	146.25	6.09
60	151.92	6.23	152.62	6.37
62	158.15	6.23*	158.85	6.23*
64	164.36	6.21	165.11	6.26
66	170.64	6.28	171.35	6.24
		3)18.72		18.73
		2)6.24		6.2433
		3.1200		3.1216
		3.1216		
		2)6.2416		
		3.1208	Velocity with a Motive Wt. of 12 lbs.	

TUESDAY, November 29, 1796.

Conductor, parallelopipedon P, with A fore and e after bodies, &c.

Water in the Dock, 11 feet 9 inches.—Wind, N. W. Light Airs.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Wt. 24 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.71	3.71	4.26	4.26	3.38	3.38
8	12.50	8.79	13.41	9.15	11.85	8.47
12	24.95	12.45	25.95	12.54	24.00	12.15
16	39.62	14.67	40.76	14.81	38.56	14.56
20	55.79	16.17	56.97	16.21	54.64	16.08
24	72.76	16.97	74.02	17.05	71.49	16.85
28	90.18	17.42	91.50	17.48	88.95	17.46
32	108.04	17.86	100.43	8.93	106.71	17.76
34	117.00	8.96	109.40	8.97	115.70	8.99
36	125.94	8.94	118.30	8.90	124.68	8.98
38	135.00	9.06	127.35	9.05	133.67	8.99
40	144.05	9.05	136.35	9.00	142.71	9.04*
42	153.06	9.01*	145.39	9.04	151.74	9.03
44	162.12	9.06	154.39	9.00*	160.78	9.04
46	171.15	9.03	163.46	9.07	.....	.....
48	.....	.....	172.56	9.10	.....	.....
		3)27.10		27.17		27.11
		2)9.0333		9.0566		9.0366
		4.5166		4.5283		4.5183
		4.5283				
		4.5183				
		3)13.5632				
		4.5211	Velocity with a Motive Weight of 24 lbs.			

THURSDAY, November 24, 1796.

Conductor, parallelopipedon P, with A fore and e after bodies, &c.

Water in the Dock, 10 feet 6 inches.—Wind, East. Light Breeze.

System Four-fold.

Total Wt. 147 lbs. 14 oz.			M. Wt. 36 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.15	7.15	7.09	7.09
8	20.56	13.41	20.21	13.12
12	37.99	17.43	37.46	17.25
16	57.69	19.66	56.87	19.41
20	78.30	20.65	77.40	20.53
24	99.80	21.50	98.83	21.43
26	110.60	10.80	109.75	10.92
28	121.64	11.04	120.71	10.96
30	132.63	10.99	131.80	11.09
32	143.68	11.05*	142.85	11.05*
34	154.68	11.00	153.91	11.06
36	165.70	11.02	164.98	11.07
		3)33.07		33.18
		2)11.0233		11.06
		5.5116		5.53
		5.5300		
		2)11.0416		
		5.5208 Velocity with a Motive Weight of 36 lbs.		

TUESDAY, September 6, 1796.

Conductor, parallelopipedon P, with A fore and e after bodies, &c.

Thermometer in the Air, 70½°;—In the Dock, 62°.—Water in the Dock, 12 ft. 4 in.—Wind, S. W. Fresh Breeze.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.						
Accelerating Wt. 42 lbs.			Accel. Wt. 42 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.20	3.20	1.73	1.73	4.29	4.29
4	9.40	6.20	7.10	5.37	11.61	7.32
6	17.90	8.50	15.02	7.92	21.11	9.50
8	28.30	10.40	24.83	9.81	32.21	11.10
10	39.68	11.38	35.91	11.08	44.49	12.28
12	52.00	12.32	48.12	12.21	57.30	12.91†
14	64.70	12.70	60.67	12.55	70.22	12.92
16	77.52	12.82	73.50	12.83	83.10	12.88
18	90.29	12.77	86.30	12.80	96.00	12.90
20	103.13	12.84	99.10	12.80	108.84	12.84
22	116.00	12.87	111.99	12.89	121.79	12.95
24	128.97	12.97	124.91	12.92	134.69	12.90*
26	141.90	12.93*	137.76	12.85*	147.63	12.94
28	154.80	12.90	150.60	12.84	160.52	12.89
30	167.82	13.02	163.56	12.96	.....	.....
		3)38.85		38.65		38.73
		2)12.95		12.8833		12.91
		6.4750		6.4416		6.455
		6.4416				
		6.4550				
		3)19.3716				
		6.4572 Velocity with a Motive Weight of 48 lbs.				

† Query 12.81?

WEDNESDAY, September 7, 1796.

Conductor, parallelopipedon P, with A fore and e after bodies, &c.

Thermometer in the Air, 70°;—In the Dock, 62°.—Water in the Dock, 12 ft. 3 in.—Wind, West. Strong Breeze.

System Four-fold.

	lbs. oz.	lbs.
T. W.	293 6	M. W. 72

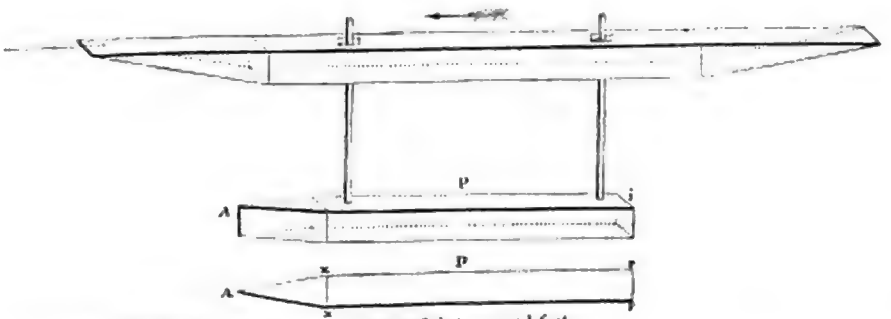
Accel. Wt. 56 lbs.

Sec.	Feet.	Differences.
2	2.55	2.55
4	10.48	7.93
6	21.99	11.51
8	35.91	13.92
10	51.11	15.20
12	66.52	15.41
14	82.19	15.67
16	98.06	15.87
18	114.11	16.05
20	129.93	15.82
22	146.00	16.07*

2) 16.07

8.035 Velocity with a Motive Weight of 72 lbs.

Conductor, parallelopipedon P, with A fore and i after bodies, the centre of the lower body being immersed six feet.



∠ of incidence, 9° 35′ 38″. x A = 3 feet. r r = 1 foot.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	2.1475	3.0783	4.4250	5.4877	.....	.....	.....	.....	.....	.....
Correction for Line	.....	2.1526	3.0940	4.4476	5.5212	.....	.....	.....	.....	.....	.....
Hutt. Correction, or Regular Series	1.4938	2.1512	3.0977	4.4607	5.5212	6.4234	7.2234	7.9507	9.1988	10.356	11.407

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3988	5.2238	11.291	19.508	29.816	42.165	56.520	72.856	91.137	111.35	133.46	157.47	197.73
Conductor and Bars	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.134	48.904	59.69	71.49	84.29	105.74
Resistance and Friction....	0.6341	2.3846	5.175	8.967	13.736	19.460	26.123	33.722	42.233	51.66	61.97	73.18	91.99
Friction on 42.958 feet ...	0.1596	0.6140	1.347	2.349	3.621	5.151	6.939	8.981	11.272	13.81	16.59	19.62	24.72
Plus and Minus Pressures..	0.4745	1.7706	3.828	6.618	10.115	14.309	19.184	24.741	30.961	37.85	45.38	53.56	67.27
Plus Pressure, 1798	0.2101	0.8624	1.944	3.432	5.308	7.549	10.136	13.056	16.284	19.81	23.61	27.68	34.34
Minus Pressure	0.2644	0.9082	1.884	3.186	4.807	6.760	9.048	11.685	14.677	18.04	21.77	25.88	32.93

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.	
6 and 12	1.9106					
24	1.9103	12..24	1.9099			
36	1.9023	36	1.8970	24..36	1.8751	

6)11.4052

Mean 6 lbs. and 36 lbs.. 1.9009

FRIDAY, September 2, 1796.

Conductor, parallelopipedon P, with A fore and i after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 59°;—In the Dock, 62½°.—Water in the Dock, 12 ft. 6 in.—Calm.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.19	2.19	1.79	1.79	2.19	2.19
8	5.90	3.71	5.27	3.48	6.10	3.91
12	11.10	5.20	10.03	4.76	11.36	5.26
16	17.38	6.28	16.20	6.17	17.80	6.44
20	24.59	7.21	23.11	6.91	25.10	7.30
24	32.33	7.74	30.80	7.69	32.94	7.84
28	40.68	8.35	39.00	8.20	41.40	8.46
32	49.18	8.50	47.37	8.37	49.89	8.49
36	57.74	8.56	55.96	8.59	58.50	8.71
40	66.30	8.56	64.41	8.45	67.00	8.50
44	74.81	8.51	72.90	8.49	75.50	8.50
48	83.34	8.53	81.40	8.50	83.94	8.44
52	91.81	8.47	89.90	8.50	92.50	8.56
56	100.32	8.51	98.36	8.46	100.99	8.49
60	108.92	8.60	106.81	8.45	109.49	8.50
64	117.39	8.47	115.36	8.55	118.07	8.58
68	125.91	8.52	123.98	8.62	126.57	8.50
72	134.44	8.53	132.49	8.51	135.17	8.60
76	142.98	8.54	141.10	8.61	143.72	8.55
80	151.52	8.54*	149.71	8.61*	152.32	8.60*
84	160.01	8.49	158.30	8.59	160.89	8.57
88	168.59	8.58	166.97	8.67	169.55	8.66
		3)25.61		25.87		25.83
		4)8.5366		8.6233		8.61
		2.1341		2.1558		2.1525
		2.1558				
		2.1525				
		3)6.4424				
		2.1475 Velocity with a Motive Weight of 6 lbs.				

THURSDAY, September 1, 1796.

Conductor, parallelopipedon P, with A fore and i after bodies, &c.

Thermometer in the Air, 61½°;—In the Dock, 63½°.—Water in the Dock, 11 ft. 9 in.—Wind, N. W. Fresh Breeze.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.03	4.03	4.47	4.47	3.95	3.95
8	11.25	7.22	11.94	7.47	11.10	7.15
12	20.60	9.35	21.53	9.59	20.40	9.30
16	31.59	10.99	32.55	11.02	31.29	10.89
20	43.59	12.00	44.58	12.03	43.17	11.88
24	56.04	12.45	56.93	12.35	55.51	12.34
28	68.55	12.51	69.35	12.42	67.98	12.47
32	80.90	12.35	81.65	12.30	80.16	12.18
36	93.16	12.26	93.92	12.27	92.93	12.17
40	105.38	12.22	106.10	12.18	104.65	12.32
44	117.55	12.17	118.38	12.28	116.98	12.33
48	129.77	12.22	130.55	12.17	129.11	12.13
50	135.80	6.03	136.65	6.10	135.28	6.17
52	141.94	6.14	142.83	6.18	141.41	6.13
54	148.04	6.10	148.95	6.12*	147.57	6.16
56	154.26	6.22*	155.21	6.26	153.64	6.07*
58	160.36	6.10	161.29	6.08	159.85	6.21
60	166.60	6.24	167.41	6.12	166.00	6.15
62	172.80	6.20	.....	.....	172.11	6.11
		4)24.76		24.58		24.54
		2)6.19		6.145		6.135
		3.0950		3.0725		3.0675
		3.0725				
		3.0675				
		3)9.2350				
		3.0783 Velocity with a Motive Wt. of 12 lbs.				

THURSDAY, September 1, 1796.

Conductor, parallelopipedon P, with A fore and i after bodies, &c.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Weight 24 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.53	4.53	5.71	5.71	5.60	5.60
8	15.19	10.66	17.30	11.59	17.04	11.44
12	30.00	14.81	52.73	15.43	52.40	15.36
16	46.99	16.99	49.80	17.07	49.56	17.16
20	64.65	17.66	67.42	17.62	66.90	17.34
24	82.13	17.48	85.07	17.65	84.50	17.60
28	99.73	17.60	102.71	17.64	102.11	17.61
30	108.58	8.85	111.60	8.89	110.93	8.82
32	117.42	8.84	120.43	8.83	119.74	8.81
34	126.38	8.96	129.37	8.94	128.59	8.85
36	135.09	8.71	138.22	8.85	137.43	8.84
38	143.94	8.85	147.11	8.89	146.28	8.85
40	152.79	8.85*	155.96	8.85*	155.12	8.84*
42	161.65	8.86	164.83	8.87	163.97	8.85
44	170.45	8.80	173.70	8.87	172.83	8.86
		3)26.51		26.59		26.55
		2)8.8366		8.8633		8.85
		4.4183		4.4316		4.425
		4.4316				
		4.4250				
		3)13.2749				
		4.4249 Velocity with a Motive Weight of 24 lbs.				

THURSDAY, September 1, 1796.

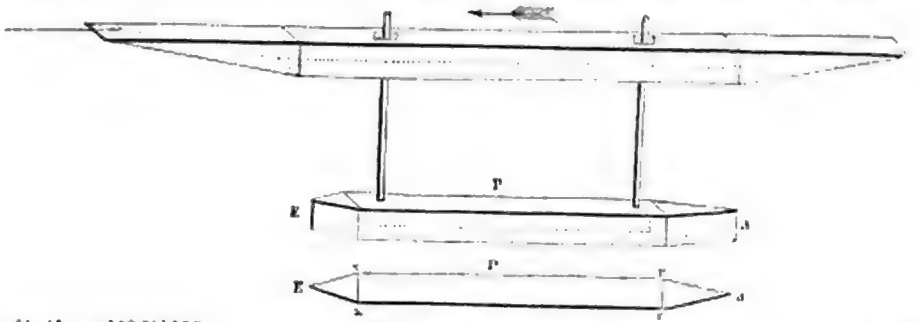
Conductor, parallelopipedon P, with A fore and i after bodies, &c.

System Four-fold.

Total Weight 147 lbs. 14 oz. Motive Weight 36 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.61	3.61	7.90	7.90	3.70	3.70
8	16.03	12.42	21.46	13.56	15.78	12.08
12	33.98	17.95	41.45	19.99	33.53	17.75
16	54.58	20.60	63.40	21.95	53.88	20.35
20	76.12	21.54	84.75	21.35	75.30	21.42
24	97.69	21.57	106.23	21.48	96.78	21.48
26	108.54	10.85	117.06	10.83	118.49	21.71
28	119.38	10.84	128.00	10.94	129.50	11.01
30	130.31	10.93	138.79	10.79	140.41	10.91
32	141.26	10.95	149.77	10.98*	151.41	11.00*
34	152.20	10.94*	160.75	10.98	162.40	10.99
36	163.14	10.94	171.73	10.98	173.45	11.05
38	174.06	10.92	.....	.....	.....	.....
		3)32.80		32.94		33.04
		2)10.9333		10.98		11.0133
		5.4666		5.49		5.5066
		5.4900				
		5.5066				
		3)16.4632				
		5.4877 Velocity with a Motive Weight of 36 lbs.				

N. B. A Motive Weight of 60 lbs. produced a corrected velocity of 7.0766 feet, and a Motive Weight of 72 lbs. gave a corrected velocity of 7.7981 feet per second; but as, in both cases, the bodies trembled, the experiments are rejected. Query, from what cause does this arise?

Conductor, parallelopipedon P, with E fore and a after bodies, the centre of the lower body being immersed six feet.



∠ of incidence, 19° 28′ 16″. x E = 1 foot 6 inches. r a = 3 feet. ∠ of incidence, 9′ 35′ 38″.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	2.2144	3.1588	4.5311	5.5794	6.5794	7.4258	.....	9.5150	10.7187	11.8216
Correction for Line	.....	2.2197	3.1749	4.5543	5.6135	6.6196	7.4711	.....	9.5940	10.8076	11.9196
Hutt. Correction, or Regular Series	1.5105	2.1886	3.1713	4.5951	5.7084	6.6584	7.5027	8.2716	9.5940	10.8230	11.9410

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.3880	5.0700	10.817	18.520	28.163	39.512	52.705	67.645	84.284	102.65	122.66	144.32	180.54
Conductor and Bars.....	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.134	48.904	59.69	71.49	84.29	105.74
Resistance and Friction	0.6233	2.2308	4.701	7.979	12.023	16.807	22.308	28.511	35.380	42.96	51.17	60.03	74.80
Friction on 44.372 feet....	0.1649	0.6342	1.391	2.426	3.740	5.321	7.168	9.276	11.642	14.27	17.14	20.27	25.53
Plus and Minus Pressures..	0.4584	1.5966	3.310	5.553	8.283	11.486	15.140	19.235	23.738	28.69	34.03	39.76	49.27
Minus Pressure, 1798.....	0.0048	0.0196	0.045	0.082	0.129	0.192	0.266	0.350	0.450	0.56	0.69	0.82	1.06
Plus Pressure	0.4536	1.5770	3.265	5.471	8.154	11.294	14.874	18.885	23.288	28.13	33.34	38.94	48.21

Powers for calculating the Huttonian Correction, or Regular Series.

| lbs. | lbs. | | | | | | | | | | | |

WEDNESDAY, September 7, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 70°;—In the Dock, 62°.—Water in the Dock, 12 ft. 3 in.—Wind, West. Strong Breeze.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accel. Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.21	2.21	2.10	2.10	1.46	1.46
8	6.30	4.09	5.90	3.80	4.90	3.44
12	11.71	5.41	11.09	5.19	9.99	5.09
16	18.24	6.53	17.52	6.43	16.21	6.22
20	25.59	7.35	24.80	7.28	23.33	7.12
24	33.68	8.09	32.81	8.01	31.30	7.97
28	42.27	8.59	41.37	8.56	39.69	8.39
32	51.05	8.78	50.22	8.85	48.56	8.87
36	59.90	8.85	59.10	8.88	57.50	8.94
40	68.78	8.88	68.00	8.90	66.46	8.96
44	77.68	8.90	76.83	8.83	75.38	8.92
48	86.53	8.85	85.70	8.87	84.24	8.86
52	95.37	8.84	94.49	8.79	93.00	8.76
56	104.28	8.91	103.34	8.85	101.89	8.89
60	113.01	8.73	112.18	8.84	110.70	8.81
64	121.84	8.83	120.96	8.78	119.50	8.80
68	130.66	8.82	129.82	8.86	128.41	8.91
72	139.50	8.84*	138.73	8.91*	137.22	8.81*
76	148.30	8.80	147.55	8.82	146.07	8.85
80	157.15	8.85	156.50	8.95	154.96	8.89
		3)26.49		26.68		26.55
		4)8.83		8.8933		8.85
		2.2075		2.2233		2.2125
		2.2233				
		2.2125				
		3)6.6433				
		2.2144 Velocity with a Motive Weight of 6 lbs.				

TUESDAY, September 6, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

Thermometer in the Air, 70¼°;—In the Dock, 62°.—Water in the Dock, 12 ft. 4 in.—Wind, S. W. Fresh Breeze.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.29	4.29	4.60	4.60	2.60	2.60
8	12.40	8.11	12.20	7.60	8.74	6.14
12	23.14	10.74	21.89	9.69	17.41	8.07
16	35.60	12.46	33.12	11.23	27.82	10.41
20	49.13	13.53	45.27	12.15	39.42	11.60
24	62.88	13.75	57.90	12.63	51.93	12.51
28	76.09	13.21	70.50	12.60	64.62	12.69
32	88.98	12.89	82.98	12.48	77.05	12.43
36	101.58	12.60	95.40	12.42	89.43	12.38
40	114.18	12.60	107.67	12.27	101.81	12.38
44	126.82	12.64	120.04	12.37	114.20	12.39
48	139.43	12.61	132.41	12.37	126.53	12.33
50	145.83	6.40	138.70	6.29	138.94	12.41
52	152.11	6.28	144.82	6.12	145.09	6.15
54	158.49	6.38*	151.12	6.30	151.39	6.30
56	164.78	6.29	157.33	6.21*	157.68	6.29
58	171.15	6.37	163.71	6.38	164.00	6.32*
60	.....	.....	170.03	6.32	170.31	6.31
62	.....	.....	.....	.....	176.59	6.28
		3)19.04		18.91		18.91
		2)6.3466		6.3033		6.3033
		3.1733		3.1516		3.1516
		3.1516				
		3.1516				
		3)9.4765				
		3.1588 Velocity with a Motive Weight of 12 lbs.				

TUESDAY, September 6, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Weight 24 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.37	5.37	5.88	5.88	4.40	4.40
8	16.66	11.29	17.77	11.89	15.20	10.80
12	32.03	15.37	33.31	15.54	30.18	14.98
16	49.48	17.45	50.87	17.46	47.36	17.18
20	67.58	18.10	68.96	18.09	65.33	17.97
24	85.78	18.20	86.87	17.91	83.31	17.98
28	103.72	17.94	104.74	17.87	101.29	17.98
32	121.72	18.00	122.71	17.97	119.21	17.92
34	130.77	9.05	131.73	9.02	128.32	9.11
36	139.82	9.05	140.75	9.02	137.32	9.00
38	148.87	9.05*	149.87	9.12*	146.38	9.06
40	157.96	9.09	158.87	9.00	155.44	9.06*
42	167.03	9.07	167.90	9.03	164.44	9.00
44	.....	.....	.....	.....	173.58	9.14
		3)27.21		27.15		27.20
		2)9.07		9.05		9.0666
		4.5350		4.525		4.5333
		4.5250				
		4.5333				
		3)13.5933				
		4.5311 Velocity with a Motive Weight of 24 lbs.				

MONDAY, September 5, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

Thermometer in the Air, 67½°;—In the Dock, 62½°.—Water in the Dock, 12 feet 6 inches.—Wind, W. S. W. Light Breeze.

System Four-fold.

Total Weight 147 lbs. 14 oz. Motive Weight 36 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.41	8.41	4.78	4.78	4.98	4.98
8	24.10	15.69	18.30	13.52	18.62	13.64
12	43.58	19.48	36.69	18.39	13.10	18.48
16	65.03	21.45	57.52	20.83	57.92	20.82
20	86.54	21.51	79.07	21.55	79.39	21.47
22	108.40	11.86	100.78	21.71	100.87	21.48
24	119.50	11.10	111.83	11.05	111.79	10.92
26	130.50	11.00	122.80	11.97	122.70	11.00†
28	141.59	11.09	133.90	11.10	133.80	11.10
30	152.72	11.13*	145.01	11.11*	144.90	11.10*
32	164.17	11.45	156.30	11.29	156.00	11.10
34	175.12	10.95	167.37	11.07	167.23	11.23
		3)33.53		33.47		33.43
		2)11.1766		11.1566		11.1433
		5.5883		5.5783		5.5716
		5.5783				
		5.5716				
		3)16.7382				
		5.5794 Velocity with a Motive Weight of 36 lbs.				

† Query 10.91?

MONDAY, September 5, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.52	4.52	5.60	5.60	2.80	2.80
4	12.28	7.76	13.51	7.91	9.22	6.42
6	22.27	9.99	23.51	10.00	18.10	8.88
8	33.92	11.65	35.20	11.69	29.05	10.95
10	46.59	12.67	47.49	12.29	41.20	12.15
12	59.79	13.20	60.50	13.01	53.88	12.68
14	73.10	13.41	73.48	12.98	66.82	12.94
16	86.30	13.20	86.41	12.93	79.71	12.89
18	99.37	13.07	99.39	12.98	92.68	12.97
20	112.58	13.21	112.43	13.04	105.73	13.05
22	125.62	13.04	125.50	13.07	118.83	13.10
24	138.76	13.14*	138.68	13.18*	132.08	13.25
26	151.94	13.18	151.82	13.14	145.11	13.03*
28	165.11	13.17	165.00	13.18	158.32	13.21
30	.....	.....	.....	.....	171.52	13.20
		3)39.49		39.50		39.44
		2)13.1633		13.1666		13.1466
		6.5816		6.5833		6.5733
		6.5833				
		6.5733				
		3)19.7382				
		6.5794 Velocity with a Motive Weight of 48 lbs.				

MONDAY, September 5, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

System Four-fold.

Total Weight 245 lbs. Motive Weight 60 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.60	1.60	4.87	4.87	1.56	1.56
4	7.73	6.13	14.31	9.44	7.63	6.07
6	17.14	9.41	24.40	10.09	17.18	9.55
8	29.10	11.96	37.36	12.96	28.99	11.81
10	42.63	13.53	51.48	14.12	42.90	13.61
12	56.97	14.34	66.01	14.53	56.71	14.11
14	71.71	14.74	80.71	14.70	71.60	14.89
16	86.45	14.74	95.61	14.90	86.45	14.85
18	101.09	14.64	110.17	14.56	101.22	14.77
20	115.90	14.81	125.01	14.84	115.99	14.77
22	130.78	14.88	139.93	14.92	130.80	14.81
24	145.58	14.80	154.80	14.87*	145.56	14.76
26	160.35	14.77*	169.69	14.89	160.37	14.81*
28	175.21	14.86	.....	.....	175.28	14.91
		2)29.63		29.76		29.72
		2)14.815		14.88		14.86
		7.4075		7.44		7.43
		7.4400				
		7.4300				
		3)22.2775				
		7.4258 Velocity with a Motive Weight of 60 lbs.				

SATURDAY, September 3, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

Thermometer in the Air, 62½°;—In the Dock, 66°.—Water in the Dock, 12 feet 7 inches.—Calm.

System Four-fold.

Total Wt. 393 lbs. 12 oz.			Motive Wt. 95 lbs.	
Accelerating Wt. 112 lbs.			Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.38	6.38	4.55	4.55
4	18.21	11.83	15.15	10.60
6	33.68	15.47	29.89	14.74
8	51.29	17.61	47.06	17.17
10	69.83	18.54	65.30	18.24
12	88.50	18.67	83.60	18.30
14	107.10	18.60	101.89	18.29
16	125.94	18.84	120.41	18.52
18	144.70	18.76	139.01	18.60
20	163.75	19.05*	158.02	19.01*

2) 19.05 — 19.01

9.525
9.505

2) 19.030

9.515 Velocity with a Motive Weight of 95 lbs.

SATURDAY, September 3, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

System Four-fold.

Total Weight 489 lbs. 12 oz. Motive Weight 119 lbs.								
Accel. Weight 112 lbs.			Accel. Wt. 112 lbs.		Accel. Wt. 112 lbs.		Accel. Wt. 112 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.38	1.38	1.17	1.17	1.35	1.35	4.73	4.73
4	10.24	8.86	10.00	8.83	10.50	9.15	17.27	12.54
6	24.86	14.62	.....	.....	25.30	14.80	34.52	17.35†
8	42.61	17.75	42.98	.....	43.68	18.38	54.10	19.58
10	61.68	19.07	62.45	19.47	63.29	19.61	74.41	20.31
12	81.64	19.96	82.68	20.23	83.62	20.33	95.15	20.74
14	102.14	20.50	103.19	20.51	104.32	20.70	116.00	20.85
16	122.97	20.83	124.27	21.08	125.34	21.02	137.20	21.20
18	144.30	21.33	145.44	21.17	146.70	21.36	158.60	21.40*
20	165.77	21.47*	166.88	21.44*	168.14	21.44*	.....	.....
		2)21.47		21.44		21.44		21.40
		10.735		10.72		10.72		10.70
		10.720						
		10.720						
		10.700						
		4)42.875						
		10.7187 Velocity with a Motive Weight of 119 lbs.						

† Query 17.25?

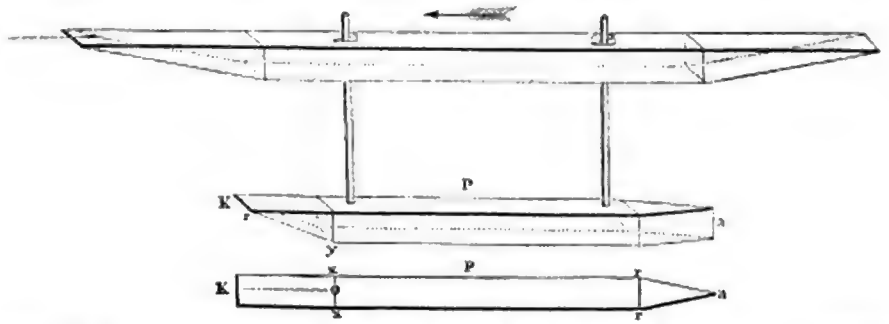
SATURDAY, September 3, 1796.

Conductor, parallelopipedon P, with E fore and a after bodies, &c.

System Four-fold.

Total Weight 586 lbs. Motive Weight 143 lbs.						
Accel. Weight 140 lbs.			Accel. Wt. 168 lbs.		Accel. Wt. 168 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.00	6.00	6.90	6.90	7.60	7.60
4	20.46	14.46	22.51	15.61	23.60	16.00
6	40.20	19.74	43.00	20.49	44.11	20.51
8	61.85	21.65	65.60	22.60	66.70	22.59
10	84.53	22.68	88.50	22.90	89.62	22.92
12	107.62	23.09	111.80	23.30	112.90	23.28
14	131.10	23.48	135.25	23.45	136.26	23.36
16	154.69	23.59*	158.97	23.72*	159.88	23.62*
		2)23.59		23.72		23.62
		11.795		11.86		11.81
		11.860				
		11.810				
		3)35.465				
		11.8216 Velocity with a Motive Weight of 143 lbs.				

Conductor, parallelopipedon P, with K fore and a after bodies, the centre of the lower body being immersed six feet.



∠ of incidence, 19° 28′ 16″. o K = 2 feet 10 inches. r a = 3 feet. Slant r y = 3 feet. ∠ of incidence, 9° 35′ 38″.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	2.2071	3.1627	4.5538	.....	6.6066	7.4675	.....	.....	.....	.....
Correction for Line.....	.....	2.2124	3.1788	4.5770	.....	6.6469	7.5134	.....	.....	.....	.....
Hutt. Correction, or Regular Series	1.5189	2.1987	3.1829	4.6075	5.7205	6.6699	7.5134	8.2812	9.6017	10.828	11.943

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3709	5.0240	10.741	18.414	27.973	39.365	52.548	67.487	84.154	102.52	122.57	144.27*	180.57†
Conductor and Bars.....	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.134	48.904	59.69	71.49	84.29	105.74
Resistance and Friction..	0.6062	2.1848	4.625	7.873	11.893	16.660	22.151	28.353	35.250	42.83	51.08	59.96	74.73
Friction on 48.614 feet..	0.1806	0.6948	1.524	2.658	4.097	5.829	7.853	10.163	12.755	15.63	18.78	22.21	27.97
Plus and Minus Pressures	0.4256	1.4900	3.101	5.215	7.796	10.831	14.298	18.190	22.495	27.20	32.30	37.75	46.76
Minus Pressure (1798) ..	0.0048	0.0196	0.045	0.082	0.129	0.192	0.266	0.350	0.450	0.56	0.69	0.82	1.06
Plus Pressure.....	0.4208	1.4704	3.056	5.133	7.667	10.639	14.032	17.840	22.045	26.64	31.61	36.93	45.70

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
6 and	12	1.9125							
	24	1.9070	12.. 24	1.8667					
	48	1.8903	48	1.8793	24.. 48	1.8578			
	60	1.8834	60	1.8711	60	1.8487	48.. 60	1.8210	

10) 18.7378

Mean 12 lbs. and 60 lbs. = 1.8738

* *Should be 144.25?*

† Should be 180.47?

371

FRIDAY, September 9, 1796.

Conductor, parallelopipedon P, with K fore and a after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 77°;—In the Dock, 63°.—Water in the Dock, 12 feet 6 inches.—Calm.

System Four-fold.

Total Wt. 24 lbs. 12 oz. 1 dr. M. Wt. 6 lbs.				
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	1.18	1.18	1.62	1.62
8	4.17	2.99	4.82	3.20
12	8.72	4.55	9.32	4.50
16	14.43	5.71	14.88	5.56
20	21.05	6.62	21.39	6.51
24	28.40	7.35	28.59	7.20
28	36.17	7.77	36.22	7.63
32	44.35	8.18	44.29	8.07
36	52.62	8.27	52.47	8.18
40	61.10	8.48	60.82	8.35
44	69.56	8.49†	69.23	8.41
48	78.07	8.51	77.75	8.52
52	86.70	8.63	86.33	8.58
56	95.29	8.59	94.96	8.63
60	103.97	8.68	103.60	8.64
64	112.66	8.69	112.28	8.68
68	121.37	8.71	120.94	8.66
72	130.12	8.75	129.73	8.79
76	138.98	8.86*	138.52	8.79*
80	147.77	8.79	147.37	8.85
84	156.60	8.83	156.22	8.85
		3)26.48		26.49
		4)8.8266		8.83
		2.2066		2.2075
		2.2075		
		2)4.4141		
		2.2071 Velocity with a Motive Weight of 6 lbs.		

† Should be 8.46?

MONDAY, September 12, 1796.

Conductor, parallelopipedon P, with K fore and a after bodies, &c.

Thermometer in the Air, 70°;—In the Dock, 64°.—Water in the Dock, 11 feet 9 inches.—Calm.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.16	2.16	7.59	7.59	3.60	3.60
8	7.99	5.83	15.90	8.31	10.14	6.54
12	16.29	8.21†	26.06	10.16	19.23	9.09
16	26.50	10.21	37.44	11.38	29.87	10.64
20	38.06	11.56	49.76	12.32	41.63	11.76
24	50.44	12.38	62.27	12.51	54.13	12.50
28	63.01	12.57	74.75	12.48	66.77	12.64
32	75.61	12.60	87.10	12.35	79.28	12.51
36	88.09	12.48	99.41	12.31	91.70	12.42
40	100.59	12.50	111.82	12.41	104.05	12.35
44	113.10	12.51	124.25	12.43	116.41	12.36
48	125.66	12.66‡	136.68	12.43	128.83	12.42
52	138.25	12.59	142.95	6.27	141.23	12.40
54	144.58	6.33	149.19	6.24	147.47	6.24
56	150.95	6.37	155.51	6.32	153.73	6.26
58	157.29	6.34*	161.73	6.22*	159.91	6.18
60	163.63	6.34	168.11	6.38	166.25	6.34*
62	170.04	6.41	174.43	6.32	172.53	6.28
64	.....	.....	.....	.....	178.83	6.30
		3)19.09		18.92		18.92
		2)6.3633		6.3066		6.3066
		3.1816		3.1533		3.1533
		3.1533				
		3.1533				
		3)9.4882				
		3.1627 Velocity with a Motive Weight of 12 lbs.				

The first experiment was made on the 9th inst.

† Should be 8.30?

‡ Query 12.56?

MONDAY, September 12, 1796.

Conductor, parallelopipedon P, with K fore and a after bodies, &c.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Weight 24 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.62	4.62	6.58	6.58	5.91	5.91
8	15.40	10.78	18.66	12.08	17.49	11.58
12	30.27	14.87	34.14	15.48	42.79†	15.30
16	47.53	17.26	51.60	17.46	54.44‡	17.65
20	65.30	17.77	69.96	18.36	68.47	18.03
24	83.20	17.90	87.93	17.97	86.55	18.08
28	101.25	18.05	105.91	17.98	104.70	18.15
32	119.36	18.11	124.00	18.09	122.93	18.53§
34	128.44	9.08	133.00	9.00	131.96	9.03
36	137.70	9.26	142.07	9.07	140.93	8.97
38	146.74	9.04*	151.08	9.01*	150.00	9.07
40	155.93	9.19	160.13	9.05	159.15	9.15*
42	165.14	9.21	169.29	9.16	168.25	9.10
44	.....	.....	.....	.....	177.31	9.06
		3)27.44		27.22		27.31
		2)9.1466		9.0733		9.1033
		4.5733		4.5366		4.5516
		4.5366				
		4.5516				
		3)13.6615				
		4.5538 Velocity with a Motive Weight of 24 lbs.				

The first experiment was made on the 9th inst., and when drawn with a Motive Weight of 36 lbs. the body trembled.

† Should be 32.79? ‡ Should be 50.44? § Should be 18.23?

WEDNESDAY, September 14, 1796.

Conductor, parallelopipedon P, with K fore and a after bodies, &c.

Thermometer in the Air, 77°;—In the Dock, 64°.—Water in the Dock, 11 feet 4 inches.—Wind, S. W. Light Breeze.

System Four-fold.

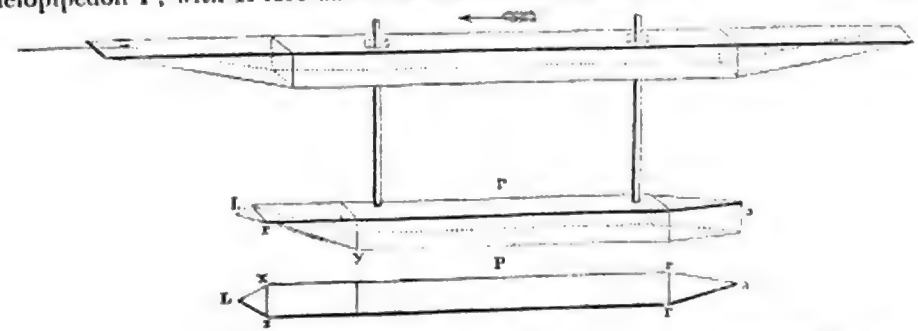
Total Wt. 196 lbs. 10 oz.			M. Wt. 48 lbs.	
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.96	3.96	3.48	3.48
4	21.00	7.04	10.09	6.61
6	20.22	9.22	19.04	8.95
8	30.57	11.35	29.95	10.91
10	43.79	12.22	41.98	12.03
12	56.65	12.86	54.43	12.45
14	69.65	13.00	67.39	12.96
16	82.64	12.99	80.30	12.91
18	95.80	13.16	93.32	13.02
20	108.98	13.18	106.40	13.08
22	122.05	13.07	119.51	13.11
24	135.21	13.16*	132.65	13.14
26	148.24	13.23	145.85	13.20*
28	161.64	13.20	159.06	13.21
30	.....	.....	172.34	13.28
		3)39.59		39.69
		2)13.1966		13.23
		6.5983		6.615
		6.6150		
		3)13.2133		
		6.6066	Velocity with a Motive Wt. of 48 lbs.	

System Four-fold.

T. W. 245 lbs.	M. W. 60 lbs.
Accelerating Wt. 56 lbs.	

Sec.	Feet.	Differences.
2	3.92	3.92
4	11.64	7.72
6	22.15	10.51
8	33.30	11.15
10	48.26	14.96
12	62.71	14.45
14	77.19	14.48
16	91.76	14.57
18	106.50	14.74
20	121.21	15.71
22	136.02	14.81
24	150.96	14.94*
26	165.89	14.93
		2)29.87
		2)14.935
	Velocity with a M. Wt. of 60 lbs.	7.4675

Conductor, parallelopipedon P, with L fore and a after bodies, the centre of the lower body being immersed six feet.



x L = 1 foot. r a = 3 feet. Slant r y = 3 feet. ∠ of incidence, 9° 35′ 38″.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment	.....	.....	3.1716	4.6150	.....	6.6583	.....	8.2075	.....	.....	.....
Correction for Line	.....	.....	3.1878	4.6386	.....	6.6990	.....	8.2756	.....	.....	.....
Hutt. Correction, or Regular Series	1.5360	2.2299	3.2077	4.6356	5.7497	6.6990	7.5420	8.3091	9.6272	10.851	11.963

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.3374	4.9314	10.579	18.182	27.675	39.007	52.139	67.040	83.682	102.04	122.10	143.82	180.20
Conductor and Bars	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.134	48.904	59.69	71.49	84.29	105.74
Resistance and Friction	0.5727	2.0922	4.463	7.641	11.595	16.302	21.742	27.906	34.778	42.35	50.61	59.53	74.46
Friction on 49.047 feet	0.1823	0.7010	1.538	2.681	4.134	5.881	7.923	10.254	12.896	15.77	18.95	22.41	28.22
Plus and Minus Pressures	0.3904	1.3912	2.925	4.960	7.461	10.421	13.819	17.652	21.882	26.58	31.66	37.12	46.24
Minus Pressure, 1798	0.0048	0.0196	0.045	0.082	0.129	0.192	0.266	0.350	0.450	0.56	0.69	0.82	1.06
Plus Pressure	0.3856	1.3716	2.880	4.878	7.332	10.229	13.553	17.302	21.432	26.02	30.97	36.30	45.18

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.	
12 and 24	1.8480	24 .. 48	1.8859	48 .. 72	1.9184	
48	1.8667	72	1.8978			
72	1.8782					
					6)	11.2950
				Mean 24 lbs. and 48 lbs.		1.8825

FRIDAY, September 16, 1796.

Conductor, parallelopipedon P, with L fore and a after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 69°;—In the Dock, 64°.—Water in the Dock, 11 feet 4 inches.—Wind, S. S. W. Moderate Breeze.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 14 lbs.			A. Wt. 14 lbs.		A. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.95	3.95	4.64	4.64	1.95	1.95
8	11.10	7.15	12.48	7.84	7.53	5.58
12	20.52	9.42	22.36	9.88	16.04	8.51
16	31.49	10.97	33.70	11.34	26.33	10.29
20	43.63	11.14	45.99	12.29	37.88	11.55
24	56.48	12.85	58.78	12.79	50.44	12.56
28	69.50	13.02	71.60	12.82	63.31	12.87
32	82.40	12.90	84.31	12.71	76.08	12.77
36	95.18	12.78	96.99	12.68	88.74	12.66
40	107.82	12.64	109.60	12.61	101.36	12.62
44	120.53	12.71	122.18	12.58	114.01	12.65
48	133.14	12.61	134.81	12.63	126.65	12.64
52	145.80	12.66	141.12	6.31	139.38	12.73
54	152.10	6.30	147.48	6.36	145.67	6.29
56	158.47	6.37*	153.80	6.32*	152.11	6.44
58	164.73	6.26	160.20	6.40	158.40	6.29*
60	171.03	6.30	166.58	6.38	164.81	6.41
62	.....	.....	.....	.....	171.17	6.36
		3)18.93		19.10		19.06
		2)6.31		6.3666		6.3533
		3.1550		3.1833		3.1766
		3.1833				
		3.1766				
		3)9.5149				
		3.1716 Velocity with a Motive Weight of 12 lbs.				

FRIDAY, September 16, 1796.

Conductor, parallelopipedon P, with L fore and a after bodies, &c.

System Four-fold.

Total Wt. 99 lbs. 2 oz.			Motive Wt. 24 lbs.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	10.13	10.13	4.57	4.57
8	24.67	14.54	15.13	10.56
12	41.87	17.20	13.02	14.89
16	60.24	18.37	47.35	17.33
20	78.70	18.46	65.88	18.53
24	97.03	18.33	84.50	18.62
28	115.45	18.42	102.92	18.42
30	124.71	9.26	121.40	18.48
32	133.90	9.19	130.60	9.20
34	143.09	9.19*	139.89	9.29
36	152.31	9.22	149.11	9.22*
38	161.52	9.21	158.40	9.29
40	.....	.....	167.65	9.25
		3)27.62		27.76
		2)9.2066		9.2533
		4.6033		4.6266
		4.6266		
		2)9.2300		
		4.6150 Velocity with a Motive Wt. of 24 lbs.		

FRIDAY, September 16, 1796.

Conductor, parallelopipedon P, with L fore and a after bodies, &c.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.32	5.32	1.60	1.60	4.58	4.58
4	13.10	7.78	6.94	5.34	11.92	7.34
6	22.88	9.78	15.03	8.09	21.70	9.78
8	34.29	11.41	25.14	10.11	32.85	11.15
10	46.77	12.48	36.72	11.58	45.30	12.45
12	59.63	12.86	49.32	12.60	58.07	12.77
14	72.71	13.08	64.23	12.91	71.10	13.03
16	85.85	13.14	75.37	13.14	84.23	13.13
18	99.07	13.22	88.50	13.13	97.46	13.23
20	112.30	13.23	101.77	13.27	110.60	13.14
22	125.57	13.27	115.01	13.24	123.90	13.30
24	138.87	13.30*	128.35	13.34*	137.20	13.30*
26	152.20	13.33	141.61	13.26	155.55	13.35
28	165.53	13.33	154.95	13.34	163.85	13.30
		3)39.96		39.94		39.95
		2)13.32		13.3133		13.3166
		6.6600		6.6566		6.6583
		6.6566				
		6.6583				
		3)19.9749				
		6.6583 Velocity with a Motive Weight of 48 lbs.				

SATURDAY, September 17, 1796.

Conductor, parallelopipedon P, with L fore and a after bodies, &c.

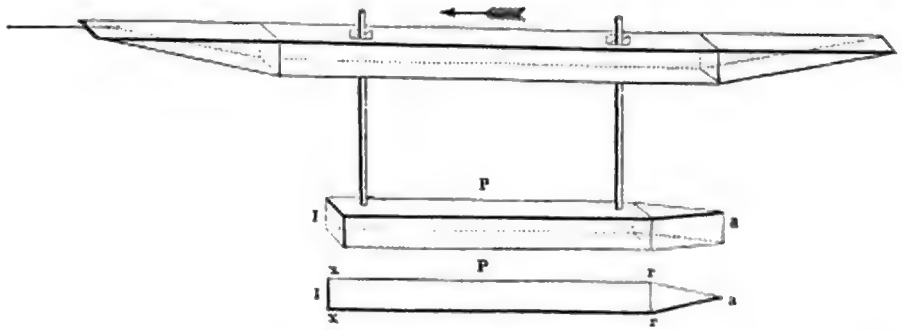
Thermometer in the Air, 76°.—Water in the Dock, 11 feet.

System Four-fold.

Total Weight 293 lbs. 6 oz. Motive Weight 72 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.57	7.57	4.22	4.22	4.07	4.07
4	18.36	10.79	12.57	8.35	12.70	8.63
6	31.90	12.54	24.11	11.54	22.46	11.76
8	46.91	15.01	38.00	13.89	38.47	14.01
10	62.52	15.61	53.07	15.07	53.59	15.12
12	78.49	15.97	68.90	15.83	69.43	15.84
14	84.67	16.18	84.97	16.07	85.43	16.00
16	110.79	16.12	101.09	16.12	101.58	16.15
18	127.01	16.22	117.32	16.23	117.83	16.25
20	143.39	16.38	133.68	16.36	134.18	16.35
22	159.70	16.31	149.95	16.27	150.61	16.43*
24	.....	.....	166.35	16.40*	.....	.....
				2)16.40		16.43
				8.200		8.215
				8.215		
				2)16.415		
				8.2075 Velocity with a Motive Weight of 72 lbs.		

The first set of experiments was rejected.

Conductor, parallelopipedon P, with I fore and a after bodies, the centre of the lower body being immersed six feet.



x x = 1 foot. r a = 3 feet. ∠ of incidence, 9° 35′ 38″.

	Motive Weights.									
	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment	1.8233	2.6187	3.7260	4.5711	5.3116	6.0322	6.6550	7.6200	8.5083	9.3750
Correction for Line	1.8277	2.6311	3.7450	4.5990	5.3440	6.0691	6.6521	7.6833	8.5932	9.4557
Hutt. Correction, or Regular Series	1.8408	2.6300	3.7665	4.6471	5.3942	6.0553	6.6554	7.6833	8.6345	9.4969

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.8480	7.0416	15.470	26.954	41.462	58.945	79.369	102.71	128.91	157.98	189.89	224.60	233.01*
Conductor and Bars	0.7647	2.8392	6.116	10.541	16.080	22.705	30.397	39.13	48.90	59.69	71.49	84.29	105.74
Resistance and Friction	1.0833	4.2024	9.354	16.413	25.382	36.240	48.972	63.58	80.01	98.29	118.40	140.31	177.27
Friction on 42.958 feet	0.1596	0.6140	1.347	2.349	3.621	5.151	6.939	8.98	11.27	13.81	16.59	19.62	24.72
Plus and Minus Pressures ..	0.9237	3.5884	8.007	14.064	21.761	31.089	42.033	54.60	68.74	84.48	101.81	120.69	152.55
Minus Pressure, 1798.....	0.0048	0.0196	0.045	0.082	0.129	0.192	0.266	0.35	0.45	0.56	0.69	0.82	1.06
Plus Pressure	0.9189	3.5688	7.962	13.982	21.632	30.897	41.767	54.25	68.29	83.92	101.12	119.87	151.49

Powers for calculating the Huttonian Correction, or Regular Series.

| lbs. | lbs. | | | | | | | | | | | |

FRIDAY, September 2, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 59°;—In the Dock, 62½.—Water in the Dock, 12 feet 6 inches.—Calm.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.42	4.42	1.85	1.85	1.89	1.89
8	11.60	7.18	5.59	3.74	5.43	3.54
12	17.58	5.98	10.55	4.96	10.43	5.00
16	24.21	6.63	16.58	6.03	16.38	5.95
20	31.27	7.06	23.20	6.62	23.04	6.66
24	38.71	7.44	30.29	7.09	30.27	7.23
28	46.02	7.31	37.81	7.52	37.72	7.45
32	53.06	7.34	45.30	7.49	45.30	7.58
36	60.60	7.24	52.82	7.52	52.93	7.63
40	67.83	7.23	60.21	7.39	60.37	7.44
44	75.00	7.17	67.60	7.39	67.79	7.42
48	82.18	7.18	74.82	7.22	75.17	7.38
52	89.38	7.20	82.04	7.22	82.42	7.25
56	96.52	7.14	89.28	7.24	89.71	7.29
60	103.78	7.26	96.43	7.15	96.99	7.28
64	111.00	7.22	103.70	7.27	104.27	7.28
68	118.21	7.21	110.90	7.20	111.59	7.32
72	125.47	7.26	118.11	7.21	118.83	7.24
76	132.73	7.26	125.31	7.20	126.17	7.34
80	139.94	7.21	132.60	7.29	133.49	7.32
84	147.27	7.33*	139.80	7.20	140.82	7.33
88	154.51	7.24	147.10	7.30*	148.13	7.31*
92	161.78	7.27	154.34	7.24	155.52	7.39
96	.....	.....	161.57	7.23	162.82	7.33
		3)21.84		21.77		22.03
		4)7.28		7.2566		7.3433
		1.8200		1.8141		1.8358
		1.8141				
		1.8358				
		3)5.4699				
		1.8233 Velocity with a Motive Weight of 6 lbs.				

THURSDAY, September 1, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

Thermometer in the Air, 61½°;—In the Dock, 63½°.—Water in the Dock, 11 feet 9 inches.—Wind, N. W. Fresh Breeze.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.72	2.72	7.07	7.07	4.55	4.55
8	8.75	6.03	15.00	7.93	11.86	7.31
12	16.87	8.12	24.47	9.47	20.93	9.07
16	26.50	9.63	34.91	10.44	31.12	10.19
20	37.05	10.55	45.81	10.90	41.92	10.80
24	48.10	11.05	56.78	10.97	52.87	10.95
28	58.92	10.82	67.55	10.77	63.83	10.96
32	69.60	10.68	78.08	10.53	74.50	10.67
36	80.03	10.43	88.50	10.42	84.90	10.40
40	90.40	10.37	98.90	10.40	95.31	10.41
44	100.70	10.30	109.31	10.41	105.69	10.38
48	111.01	10.31	119.67	10.36	116.04	10.35
52	121.35	10.34	130.09	10.42	126.49	10.45
56	131.80	10.45	135.31	5.22	131.66	5.17
58	137.01	5.21	140.57	5.26	136.91	5.25
60	142.20	5.19	145.70	5.13	142.18	5.27
62	147.42	5.22	151.00	5.30	147.40	5.22
64	152.63	5.21	156.41	5.41*	152.52	5.12
66	158.00	5.37*	161.48	5.07	157.82	5.32*†
68	163.12	5.12	166.70	5.22	163.08	5.26
70	168.38	5.26	171.90	5.20	168.32	5.24
72	173.58	5.20	.....	.....	173.50	5.18
		4)20.95		20.90		21.00
		2)5.2375		5.225		5.25
		2.6187		2.6125		2.625
		2.6125				
		2.6250				
		3)7.8562				
		2.6187 Velocity with a Motive Weight of 12 lbs.				

† Query 5.30?

THURSDAY, September 1, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Weight 24 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.96	2.96	5.30	5.30	6.53	6.53
8	12.21	9.25	16.30	11.00	18.10	11.57
12	25.30	13.09	30.52	14.02	32.49	14.39
16	40.48	15.18	45.64	15.32	47.80	15.31
20	55.85	15.37	60.86	15.22	63.15	15.35
24	70.90	15.05	75.85	14.99	78.18	15.03
28	85.78	14.88	90.61	14.76	93.10	14.92
32	100.59	14.81	105.45	14.84	108.12	15.02
36	115.40	14.81	120.30	14.95†	122.98	14.86
38	122.74	7.34	127.72	7.42	130.47	7.49
40	130.21	7.47	135.14	7.42	137.94	7.47
42	137.52	7.31	142.60	7.46	145.37	7.43
44	145.07	7.55	150.03	7.43	152.80	7.43*
46	152.52	7.45*	157.51	7.48*	160.27	7.47
48	159.96	7.44	164.93	7.42	167.73	7.46
50	167.41	7.45	172.40	7.47	.....	.....
		3)22.34		22.37		22.36
		2)7.4466		7.4566		7.4533
		3.7233		3.7283		2.7266
		3.7283				
		3.7266				
		3)11.1782				
		3.7260 Velocity with a Motive Weight of 24 lbs.				

† Query 14.85?

THURSDAY, September 1, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

System Four-fold.

Total Weight 147 lbs. 14 oz. Motive Weight 36 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt 28. lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	9.04	9.04	7.20	7.20	4.02	4.02
8	24.20	15.16	21.12	13.92	16.13	12.11
12	42.00	17.80	38.30	17.18	32.60	16.47
16	60.58	18.50	56.54	18.24	50.78	18.18
20	79.16	18.58	74.83	18.29	69.13	18.35
24	97.33	18.17	92.80	17.97	87.30	18.17
28	115.50	18.17	110.88	18.08	105.44	18.14
30	124.72	9.22	120.00	9.12	114.53	9.09
32	133.77	9.05	129.05	9.05	123.60	9.07
34	143.01	9.24*	138.12	9.07	132.82	9.22
36	152.07	9.06	147.19	9.07*	141.92	9.12
38	161.20	9.13	156.40	9.21	151.08	9.16*
40	.....	.....	165.50	9.10	160.20	9.12
42	.....	.....	.....	.....	169.39	9.19
		3)27.43		27.38		27.47
		2)9.1433		9.1266		9.1566
		4.5716		4.5633		4.5783
		4.5633				
		4.5783				
		3)13.7132				
		4.5711 Velocity with a Motive Weight of 36 lbs.				

The first set of experiments was made on Tuesday, August 7, 1796.

TUESDAY, August 30, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

Thermometer in the Air, 63½°;—In the Dock, 65°.—Water in the Dock, 11 ft. 4 in.—Wind, N. W. Fresh Breeze.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.20	5.20	10.20	10.20	6.11	6.11
8	20.22	15.02	27.85	17.65	21.60	15.49
12	40.00	19.78	48.61	20.76	41.50	19.90
16	61.21	21.21	70.09	21.48	62.65	21.15
20	82.51	21.30	91.37	21.28	84.07	21.42
24	103.90	21.39	101.98	10.61	105.53	21.46
26	114.56	11.16	112.60	10.62	115.95	10.42
28	125.25	10.69	123.20	10.60	126.59	10.64
30	135.80	10.55	133.82	10.62	137.34	10.75
32	146.39	10.59*	144.49	10.67*	147.90	10.56*
34	156.97	10.58	155.19	10.70	158.57	10.67
36	167.67	10.70	165.71	10.52	169.19	10.62
		3)31.87		31.89		31.85
		2)10.6233		10.63		10.6166
		5.3116		5.315		5.3083
		5.3150				
		5.3083				
		3)15.9349				
		5.3116 Velocity with a Motive Weight of 48 lbs.				

TUESDAY, August 30, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

System Four-fold.

Total Weight 245 lbs. Motive Weight 60 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.95	3.95	3.17	3.17	1.22	1.22
4	11.06	7.11	9.63	6.46	6.69	5.47
6	20.24	9.18	18.50	8.87	14.81	8.12
8	30.80	10.56	28.99	10.49	24.76	9.95
10	42.41	11.61	40.34	11.35	35.82	11.06
12	54.05	11.64	52.20	11.86	47.50	11.68
14	66.02	11.97	64.19	11.99	59.40	11.90
16	77.87	11.85	76.20	12.01	71.23	11.83
18	89.85	11.98	88.11	11.91	83.29	12.06
20	101.89	12.04	100.22	12.11	95.38	12.09
22	113.99	12.10	112.35	12.13	107.48	12.10
24	126.00	12.01	124.59	12.24	119.56	12.08
26	138.04	12.04*	136.70	12.11*	121.79	12.23
28	150.10	12.06	148.76	12.06	143.69	11.90*
30	162.28	12.18	160.80	12.04	155.68	11.99
32	.....	.....	.....	.....	167.88	12.20
		3)36.28		36.21		36.09
		2)12.0933		12.07		12.030
		6.0466		6.035		6.015
		6.0350				
		6.0150				
		3)18.0966				
		6.0322 Velocitywith a Motive Weight of 60 lbs.				

TUESDAY, August 30, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

System Four-fold.

Total Weight 293 lbs. 6 oz. Motive Weight 72 lbs.						
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.		Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.93	1.93	0.60	0.60	3.87	3.87
4	8.27	6.34	5.85	5.25	9.94	6.07
6	17.61	8.34	14.62	8.77	19.69	9.75
8	28.98	11.37	25.68	11.06	31.27	11.58
10	41.40	12.42	37.76	12.08	43.79	12.52
12	54.28	12.88	50.43	12.67	56.69	12.90
14	67.34	13.06	63.44	13.01	69.70	13.01
16	80.36	13.02	76.50	13.06	82.77	13.07
18	93.63	13.27	89.61	13.11	95.87	13.10
20	106.70	13.07	102.89	13.28	109.18	13.31
22	120.00	13.30	116.07	13.18	122.31	13.13
24	133.30	13.30	129.21	13.14	135.57	13.26
26	146.65	13.35*	142.58	13.37	148.74	13.17*
28	159.90	13.25	155.85	13.27*	162.21	13.47
30	.....	.....	169.20	13.35	.....	.....
		2)26.60		26.62		26.64
		2)13.30		13.31		13.32
		6.650		6.655		6.66
		6.655				
		6.660				
		3)19.965				
		6.655 Velocity with a Motive Weight of 72 lbs.				

MONDAY, August 29, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

Thermometer in the Air, 63½°;—In the Dock, 65°.—Water in the Dock, 11 ft. 5 in.—Wind, N. W. Fresh Breeze.

System Four-fold

Total Weight 393 lbs. 12 oz. Motive Weight 95 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.28	2.28	7.08	7.08	5.11	5.11
4	10.17	7.89	17.68	10.60	14.80	9.69
6	21.77	11.60	30.76	13.08	27.40	12.60
8	45.48	13.71	45.27	14.51	41.53	14.13
10	50.20	14.72	60.11	14.84	56.47	14.94
12	65.01	14.81	74.95	14.84	71.20	14.73
14	79.87	14.86	89.86	14.91	86.07	14.87
16	94.83	14.96	104.81	14.95	100.90	14.83
18	109.91	15.08	119.91	15.10	115.93	15.03
20	125.03	15.12	135.01	15.10	131.00	15.07
22	140.30	15.27*	150.28	15.27*	146.26	15.26*
24	155.56	15.26	165.50	15.22	161.42	15.16
		2)30.53		30.49		30.42
		2)15.265		15.245		15.21
		7.6325		7.6225		7.605
		7.6225				
		7.6050				
		3)22.8600				
		7.6200 Velocity with a Motive Weight of 95 lbs.				

MONDAY, August 29, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

System Four-fold.

Total Weight 489 lbs. 12 oz. Motive Weight 119 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.22	7.22	1.00	1.00	1.31	1.31
4	19.14	11.92	8.36	7.36	9.18	7.87
6	34.20	15.06	20.80	12.44	21.79	12.61
8	50.54	16.34	36.07	15.23	37.13	15.34
10	67.35	16.81	52.40	16.33	53.38	16.25
12	84.17	16.82	69.23	16.83	70.30	16.92
14	101.80	16.63	86.02	16.79	86.90	16.60
16	118.09	16.29	103.00	16.98	103.81	16.91
18	135.02	16.93	119.98	16.98	120.79	16.98
20	152.17	17.15*	137.04	17.06*	137.74	16.95*
22	169.11	16.94	154.07	17.03	154.71	16.97
		2)34.09		34.09		33.92
		2)17.045		17.045		16.96
		8.5225		8.5225		8.48
		8.5225				
		8.4800				
		3)25.5250				
		8.5083 Velocity with a Motive Weight of 119 lbs.				

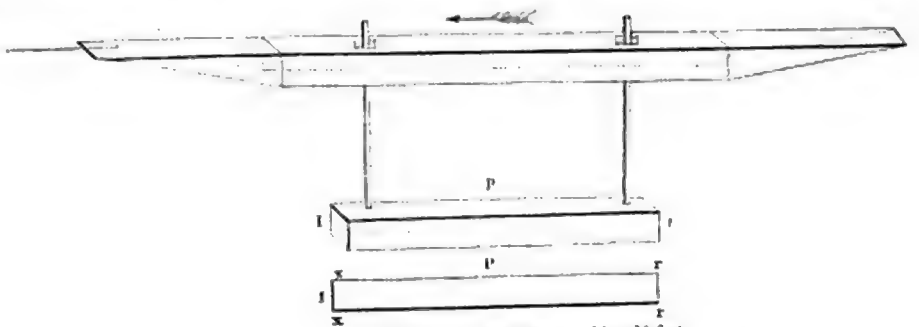
MONDAY, August 29, 1796.

Conductor, parallelopipedon P, with I fore and a after bodies, &c.

System Four-fold.

Total Weight 586 lbs. Motive Weight 143 lbs.						
Accelerating Wt. 56 lbs.			Accel. Wt. 56 lbs.		Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.38	7.38	3.90	3.90	6.70	6.70
4	20.58	13.20	15.19	11.29	19.70	13.00
6	37.22	16.64	30.69	15.50	36.17	16.47
8	55.13	17.91	48.40	17.71	54.18	18.01
10	73.42	18.29	66.63	18.23	72.33	18.15
12	92.08	18.66	85.10	18.47	90.97	18.64
14	110.51	18.43	103.80	18.70	109.41	18.44
16	129.11	18.60	122.49	18.69	127.98	18.57
18	147.70	18.59	141.09	18.60	146.59	18.61
20	166.47	18.77*	159.82	18.73*	165.34	18.75*
		2)18.77		18.73		18.75
		9.385		9.365		9.375
		9.365				
		9.375				
		3)28.125				
		9.375 Velocity with a Motive Weight of 143 lbs.				

Conductor, parallelopipedon P, with I fore and i after bodies, the centre of the lower body being immersed six feet.



x x = 1 foot. r r = 1 font. I i = 10 feet.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	.....	2.5558	3.6766	.....	5.1358	.....	6.3837	7.3675	.....	.....
Correction for Line	.....	.....	2.5688	3.6953	.....	5.1671	.....	6.4226	7.4286	.....	.....
Hutt. Correction, or Regular Series	1.2592	1.7977	2.5666	3.6643	4.5127	5.2314	5.8666	6.4427	7.4286	8.3398	9.1651

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.9153	7.3839	16.2590	28.467	43.954	62.682	84.621	109.75	138.02	169.45	203.99	241.65	305.11
Conductor and Bars.....	0.7647	2.8392	6.1157	10.541	16.080	22.705	30.397	39.13	48.90	59.69	71.49	84.29	105.74
Resistance and Friction.....	1.1506	4.5447	10.1433	17.926	27.874	39.977	54.224	70.62	89.12	109.76	132.50	157.36	199.37
Friction on 40 feet.....	0.1486	0.5717	1.2540	2.187	3.371	4.796	6.461	8.36	10.49	12.86	15.45	18.27	23.02
Plus and Minus Pressures...	1.0020	3.9730	8.8893	15.739	24.503	35.181	47.763	62.26	78.63	96.90	117.05	139.09	176.35
Plus Pressure, 1798.....	0.9061	3.6211	8.089	14.252	22.057	31.466	42.429	54.908	68.87	84.28	101.10	119.29	149.67
Minus Pressure, 1798.....	0.1629	0.6278	1.367	2.361	3.591	5.045	6.707	8.563	10.61	12.82	15.22	17.90	21.95
Plus and Minus Pressures do.	1.0690	4.2489	9.456	16.613	25.648	36.511	49.136	63.471	79.48	97.10	116.32	137.19	171.62

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.		lbs.		lbs.	
12 and	24	1.9062	24..	48	2.0675	48..	72	1.8641	72..	95	1.9050
	48	1.9836		72	1.9875		95	1.8805			
	72	1.9553		95	1.9703						
	95	1.9483									

10) 19.4683

Mean 12 lbs. and 95 lbs.. 1.9468

THURSDAY, September 22, 1796.

Conductor, parallelopipedon P, with I fore and i after bodies, the centre of the lower body being immersed six feet.

Thermometer in the Air, 60½°;—In the Dock, 63°.—Water in the Dock, 12 feet 10 inches.—Calm.

System Four-fold.

T. Wt. 49 lbs. 11 oz. 8 drs.			M. Wt. 12 lbs.	
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.85	4.85	4.50	4.50
8	11.75	6.90	11.28	6.78
12	20.57	8.82	28.00	8.72
16	30.37	9.80	29.73	9.73
20	40.76	10.39	40.23	10.50
24	51.61	10.85	51.08	10.85
28	62.73	11.12	62.26	11.18
32	73.65	10.92	73.17	10.91
36	84.09	10.44	83.70	10.53
40	94.30	10.21	94.05	10.65
44	104.40	10.10	104.31	10.26
48	114.53	10.13	114.43	10.12
52	124.55	10.02	124.50	10.07
56	134.70	10.15	134.60	10.10
58	139.88	5.18	139.64	5.04
60	144.95	5.07	144.80	5.16
62	150.01	5.06	149.81	5.01
64	155.15	5.14	154.95	5.14
66	160.22	5.07*	160.11	5.16*
68	165.30	5.08	165.15	5.04
70	170.51	5.21	170.26	5.11
		3)15.36		15.31
		2)5.12		5.1033
		2.5600		2.5516
		2.5516		
		2)5.1116		
		2.5558	Velocity with a Motive Wt. of 12 lbs.	

TUESDAY, September 20, 1796.

Conductor, parallelopipedon P, with I fore and i after bodies, &c.

Thermometer in the Air, 66°;—In the Dock, 63°.—Water in the Dock, 12 ft. 11 in.—Wind, Light Airs. Variable.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Wt. 24 lbs.						
Accelerating Wt. 14 lbs.			Accel. Wt. 14 lbs.		Accel. Wt. 14 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.31	5.31	4.32	4.32	7.26	7.26
8	15.51	10.20	14.08	9.76	18.68	11.42
12	28.34	12.83	26.65	12.57	31.98	13.30
16	42.40	14.06	40.60	13.95	46.28	14.30
20	56.92	14.52	54.89	14.29	60.71	14.43
24	71.47	14.55	69.40	14.51	75.00	14.29
28	85.82	14.35	83.68	14.28	89.21	14.21
32	100.30	14.48	98.00	14.32	103.56	14.35
36	114.88	14.58	112.42	14.42	117.88	14.32
40	129.49	14.61	126.88	14.46	125.20	7.32
42	136.88	7.39	134.16	7.28	132.31	7.11
44	144.20	7.32	141.39	7.23	139.62	7.31
46	151.60	7.40	148.65	7.26	146.87	7.25
48	158.94	7.34*	155.96	7.31	154.22	7.35
50	166.41	7.47	163.35	7.39*	161.47	7.25*
52	173.74	7.33	170.70	7.35	168.88	7.41
54	.....	.....	178.05	7.35	176.17	7.29
		3)22.14		22.09		21.95
		2)7.38		7.3633		7.3166
		3.6900		3.6816		3.6583
		3.6816				
		3.6583				
		3)11.0299				
		3.6766 Velocity with a Motive Weight of 24 lbs.				

THURSDAY, September 22, 1796.

Conductor, parallelopipedon P, with I fore and i after bodies, &c.

System Four-fold.

Total Wt. 196 lbs. 10 oz.			M. Wt. 48 lbs.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.70	5.70	6.23	6.23
4	13.28	7.58	14.37	8.14
6	22.20	8.92	23.51	9.14
8	31.91	9.71	33.46	9.95
10	42.21	10.30	43.52	10.06
12	52.45	10.24	53.88	10.36
14	62.71	10.26	64.18	10.30
16	72.80	10.09	74.42	10.24
18	83.03	10.23	84.66	10.24
20	93.24	10.21	94.98	10.32
22	103.44	10.20	105.20	10.22
24	113.58	10.14	115.49	10.29
26	123.92	10.34	125.74	10.25
28	134.12	10.20	136.04	10.30
30	144.43	10.31*	146.25	10.21*
32	154.65	10.22	156.54	10.29
34	164.96	10.31	166.83	10.29
		3)30.84		30.79
		2)10.28		10.2633
		5.1400		5.1316
		5.1316		
		2)10.2716		
		5.1358	Velocity with a Motive Wt. of 48 lbs.	

System Four-fold.

Total Wt. 293 lbs. 6 oz.			Motive Wt. 72 lbs.	
Accelerating Wt. 28 lbs.			Accel. Wt. 28 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.90	1.90	2.97	2.97
4	8.10	6.20	10.00	7.03
6	17.22	9.12	19.72	9.72
8	28.32	11.10	31.05	11.33
10	40.25	11.93	43.25	12.20
12	52.62	12.47†	55.55	12.30
14	64.93	12.31	67.97	12.42
16	77.42	12.49	80.52	12.55
18	89.91	12.49	93.13	12.61
20	102.53	12.62	105.70	12.57
22	115.20	12.67	118.35	12.65
24	128.02	12.82	131.00	12.65
26	140.61	12.59	143.75	12.75
28	153.47	12.86*	156.49	12.74*
30	166.23	12.76	169.20	12.71
		2)25.62		25.45
		2)12.81		12.725
		6.4050		6.3625
		6.3625		
		2)12.7675		
		6.3837	Velocity with a Motive Wt. of 72 lbs.	

† Query 12.37?

TUESDAY, September 20, 1796.

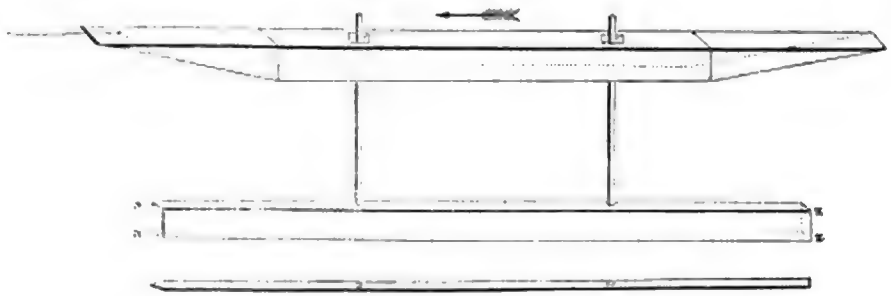
Conductor, parallelopipedon P, with I fore and i after bodies, &c.

Thermometer in the Air, 66°;—In the Dock, 63°.—Water in the Dock, 12 ft. 11 in.—Wind, Light Airs. Variable.

System Four-fold.

Total Wt. 393 lbs. 12 oz.			M. Wt. 95 lbs.	
Accel. Wt. 56 lbs.			Accel. Wt. 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.71	7.71	7.43	7.43
4	18.59	10.88	18.67	11.24
6	31.52	12.93	31.89	13.22
8	45.53	14.01	46.09	14.20
10	59.59	14.06	60.48	14.39
12	73.69	14.10	75.07	14.59
14	87.80	14.11	89.31	14.24
16	102.08	14.28	103.77	14.46
18	116.37	14.29	118.30	14.53
20	130.80	14.43	132.90	14.60
22	145.40	14.60	147.43	14.53
24	160.10	14.70*	162.20	14.77*
		2)14.70		14.77
		7.350		7.385
		7.385		
		2)14.735		
		7.3675 Velocity with a Motive Weight of 95 lbs.		

Conductor, with the Long Friction Plank, the centre being immersed six feet.



Length a a = 21 feet 3 inches. Depth a a = 1 foot. Thickness = 3 inches.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment.....	.....	2.3303	3.3672	4.820	5.9116	6.8583	7.7262	8.4100	10.0175	.....	.....
Correction for Line	.....	2.3359	3.3844	4.8446	5.9477	6.9001	7.7733	8.4614	10.101	.....	.....
Hutt. Correction, or Regular Series	1.6175	2.3258	3.3445	4.8003	5.9479	6.9155	7.7733	8.5527	9.890	11.729	12.254

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.1984	4.4986	9.7522	16.885	25.848	36.604	49.125	63.384	79.357	97.026	116.38	137.41	172.68
Conductor and Bars with Short Friction Plank ..	1.0113	3.7874	8.2000	14.184	21.698	30.709	41.193	53.124	66.488	81.266	97.45	115.02	144.50
Friction on 50 feet.....	0.1871	0.7112	1.5522	2.701	4.150	5.895	7.932	10.260	12.869	15.760	18.93	22.39	28.18

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.																
6 and 12	1.8694																
24	1.9004	12..24	1.9324														
36	1.9172	36	1.9485	24..36	1.9765												
48	1.9198	48	1.9461	48	1.9598	36..48	1.9369										
60	1.9151	60	1.9356	60	1.9379	60	1.9082	48..60	1.8726								
72	1.9307	72	1.9553	72	1.9701	72	1.9664	72	1.9877	60..72	2.1495						
95	1.8864	95	1.8922	95	1.8725	95	1.8323	95	1.7914	95	1.7545	72..95	1.5654				

28)53.4308

Mean 36 lbs. and 60 lbs. 1.9083

MONDAY, October 10, 1796.

Conductor, with the Long Friction Plank, the centre being immersed six feet.

Water in the Dock, 11 feet 9 inches.—Wind, N. W. Strong Breeze.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.20	2.20	2.12	2.12	2.48	2.48
8	6.48	4.28	6.55	4.43	7.21	4.73
12	12.41	5.93	12.60	6.05	13.50	6.29
16	19.84	7.43	20.00	7.40	21.04	7.54
20	28.14	8.30	28.36	8.36	29.59	8.55
24	37.11	8.97	37.33	8.97	38.70	9.11
28	46.56	9.45	46.52	9.19	48.22	9.52
32	56.07	9.51	56.07	9.55	57.60	9.38
36	65.60	9.53	65.42	9.35	67.04	9.44
40	74.99	9.39	74.73	9.31	76.43	9.39
44	83.39	9.40	84.00	9.27	85.79	9.36
48	93.73	9.34	93.29	9.29	95.10	9.31
52	103.09	9.36	102.51	9.22	104.46	9.36
56	112.43	9.34	111.79	9.28	113.80	9.34
60	121.76	9.33	121.03	9.24	123.16	9.36
64	131.12	9.36	130.33	9.30*	132.50	9.44
68	140.46	9.34*	139.66	9.33	141.87	9.37*
72	149.75	9.29	148.97	9.31	151.21	9.34
76	159.04	9.29	.....	.....	160.53	9.32
		3)27.92		27.94		28.03
		2)9.3066		9.3133		9.3433
		4.6533		4.6566		4.6716
		4.6566				
		4.6716				
		3)13.9815				
		2)4.6605				
		2.3303 Velocity with a Motive Wt. of 6 lbs.				

MONDAY, October 10, 1796.

Conductor, with the Long Friction Plank, the centre being immersed six feet.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 8 in. 6			A. Wt. Chain ft. 8 in. 6		A. Wt. Chain ft. 8 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.75	8.75	5.51	5.51	3.13	3.13
8	20.99	12.24	16.66	11.15	12.85	9.72
12	34.60	13.61	30.29	13.63	25.73	12.88
16	48.18	13.58	43.70	13.41	39.00	13.27
20	61.47	13.29	56.88	13.18	52.21	13.21
24	74.60	13.13	69.96	13.08	65.24	13.03
28	87.67	13.07	83.02	13.06	78.17	12.93
32	100.81	13.14	96.11	13.09	91.12	12.95
36	114.04	13.23	109.22	13.11	104.20	13.08
40	127.30	13.26	122.49	13.27	117.37	13.17
42	133.99	6.69	129.13	6.64	124.00	6.63
44	140.65	6.66	135.88	6.75	130.58	6.58
46	147.39	6.74	142.50	6.62	137.27	6.69
48	154.11	6.72*	149.21	6.71	143.97	6.70
50	160.88	6.77	155.94	6.73*	150.68	6.71
52	167.60	6.72	162.70	6.76	157.38	6.70
54	.....	.....	169.43	6.73	164.09	6.71*
56	.....	.....	.....	.....	170.83	6.74
58	.....	.....	.....	.....	177.56	6.73
		3)20.21		20.22		20.18
		2)6.7366		6.74		6.7266
		6.3683		3.37		3.3633
		3.3700				
		3.3633				
		3)10.1016				
		3.3672 Velocity with a Motive Weight of 12 lbs.				

When these experiments were made it was calm. The length of chain No. I was 12 feet 6 inches, and its weight 101 lbs. 8 oz.

SATURDAY, October 8, 1796.

Conductor, with the Long Friction Plank, the centre being immersed six feet.

Thermometer in the Air, 57°;—In the Dock, 55°.—Water in the Dock, 12 ft. 2 in.—Wind, W.S.W. Fresh Breeze.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Wt. 24 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	11.22	11.22	8.42	8.42	5.58	5.58
8	28.82	17.60	25.00	16.58	20.51	14.93
12	47.92	19.10	43.99	18.99	39.44	18.93
16	66.97	19.05	62.94	18.95	58.59	19.15
20	85.73	18.76	81.89	18.95	77.50	18.91
24	104.64	18.91	100.82	18.93	96.43	18.93
26	114.20	9.56	110.42	9.60	115.54	9.11
28	123.78	9.58	119.99	9.57	125.19	9.65
30	133.30	9.52	129.61	9.62	134.78	9.59
32	142.86	9.56	139.28	9.67	144.48	9.70
34	152.50	9.64*	148.91	9.63	154.15	9.67*
36	162.02	9.52	158.60	9.69*	163.78	9.63
38	.....	.....	168.29	9.69	.....	.....
		2)19.16		19.38		19.30
		2)9.58		9.69		9.65
		4.790		4.845		4.825
		4.845				
		4.825				
		3)14.460				
		4.820 Velocity with a Motive Weight of 24 lbs.				

SATURDAY, October 8, 1796.

Conductor, with the Long Friction Plank, the centre being immersed six feet.

System Four-fold.

Total Weight 147 lbs. 14 oz. Motive Weight 36 lbs.						
Accel. Wt. Chain 8 ft. 6 in.			A. Wt. Chain 13 ft.		A. W. Chain No. I.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.00	5.00	3.02	3.02	5.71	5.71
4	13.18	8.18	9.80	6.78	14.49	8.78
6	24.78	11.60	19.33	7.53	25.15	10.66
8	37.27	12.49	30.40	11.07	36.73	11.58
10	50.38	13.11	42.20	11.80	48.60	11.87
12	63.43	13.05	54.16	11.96	60.38	11.78
14	76.27	12.84	66.00	11.84	72.10	11.72
16	88.68	12.41	77.80	11.80	83.80	11.70
18	100.86	12.18	89.52	11.72	95.45	11.65
20	112.92	12.06	101.21	11.69	107.07	11.62
22	124.97	12.05	112.90	11.69	118.78	11.71
24	136.80	11.83	124.70	11.80	130.52	11.74
26	148.70	11.90	136.37	11.67	142.37	11.85
28	160.51	11.81*	148.19	11.82	154.20	11.83*
30	172.30	11.79	160.01	11.82*	166.03	11.83
32	.....	.....	171.87	11.86	.....	.....
		2)23.60		23.68		23.66
		2)11.80		11.84		11.83
		5.900		5.92		5.915
		5.920				
		5.915				
		3)17.735				
		5.9116 Velocity with a Motive Weight of 36 lbs.				

SATURDAY, October 8, 1796.

Conductor, with the Long Friction Plank, the centre being immersed six feet.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.						
Accel. Wt. Chain ft 13			A.W. Chain ft. 16 in. 6		A. W. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.77	3.77	5.87	5.87	3.64	3.64
4	12.19	8.32	15.81	9.94	12.24	8.60
6	23.50	11.31	28.43	12.62	23.58	11.34
8	36.41	12.91	42.29	13.86	36.75	13.17
10	49.69	13.28	56.51	14.22	50.37	13.62
12	63.15	13.46	70.57	14.06	64.27	13.90
14	76.64	13.49	84.68	14.11	77.97	13.70
16	90.22	13.58	98.42	13.74	91.59	13.62
18	103.70	13.48	112.29	13.87	105.22	13.63
20	117.38	13.68	125.99	13.70	118.88	13.66
22	131.07	13.69	139.75	13.76	132.51	13.63
24	144.79	13.72	153.51	13.76*	146.10	13.59
26	158.42	13.63*	167.28	13.77	159.83	13.73*
28	172.16	13.74	.....	.....	173.50	13.67
		2)27.37		27.53		27.40
		2)13.685		13.765		13.70
		6.8425		6.8825		6.85
		6.8825				
		6.8500				
		3)20.5750				
		6.8583 Velocity with a Motive Weight of 48 lbs.				

SATURDAY, October 8, 1796.

Conductor, with the Long Friction Plank, the centre being immersed six feet.

System Four-fold.

Total Wt. 245 lbs. Motive Wt. 60 lbs.				
Accel. Wt. Chain 15 ft.			A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.92	6.92	3.39	3.39
4	16.48	9.56	12.48	9.09
6	29.91	13.43	25.30	12.82
8	44.70	14.79	39.80	14.50
10	59.90	15.20	55.01	15.21
12	75.20	15.30	70.30	15.29
14	90.61	15.41	85.68	15.38
16	105.80	15.19	101.08	15.40
18	121.31	15.51	116.47	15.39
20	136.77	15.46	131.97	15.50
22	152.23	15.46*	147.42	15.45*
24	167.67	15.44	162.88	15.46
		2)30.90		30.91
		2)15.45		15.455
		7.7250		7.7275
		7.7275		
		2)15.4525		
		7.7262 Velocity with a Motive Wt. of 60 lbs.		

System Four-fold.

Total Wt. 293 lbs. 6 oz. M. Wt. 72 lbs.				
Accel. Wt. Chain 15 ft.			A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.23	6.23	6.59	6.59
4	17.92	11.69	18.56	11.97
6	32.50	14.58	33.28	14.72
8	48.75	16.25	49.57	16.29
10	65.32	16.57	66.08	16.51
12	82.13	16.81	82.80	16.72
14	98.81	16.68	99.42	16.62
16	115.53	16.72	116.26	16.84
18	132.33	16.80	132.95	16.69
20	149.10	16.77*	149.77	16.82*
22	165.96	16.86	166.60	16.83
		2)33.63		33.65
		2)16.815		16.825
		8.4075		8.4125
		8.4125		
		2)16.8200		
		8.4100 Velocity with a Motive Weight of 72 lbs.		

MONDAY, October 10, 1796.

Conductor, with the Long Friction Plank, the centre being immersed six feet.

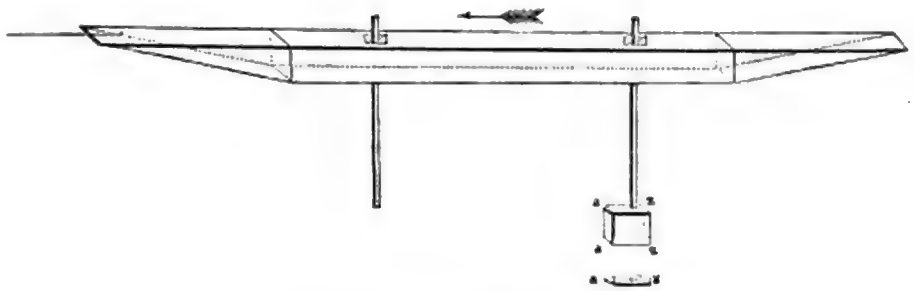
Water in the Dock, 11 feet 9 inches.—Wind, N. W. Strong Breeze.

System Four-fold.

Total Wt. 393 lbs. 12 oz. Motive Wt. 95 lbs.

A.W. Chain No. I. & 56 lbs.			A.W. Chain I. & 56 lbs.		A.W. Chain I. & 56 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.94	3.94	3.90	3.90	3.32	3.32
4	16.41	12.47	15.88	11.98	15.18	11.86
6	33.80	17.39	32.92	17.04	32.02	16.84
8	53.08	19.28	52.40	19.48	51.31	19.29
10	72.89	19.81	72.52	20.12	71.39	20.08
12	92.84	19.95	92.48	19.96	91.38	19.99
14	112.60	19.76	112.38	19.90	111.31	19.93
16	132.40	19.80	132.22	19.84	131.30	19.99
18	152.42	20.02*	152.21	19.99*	151.30	20.00*
20	172.40	19.98	172.28	20.07	171.45	20.15
		2)40.00		40.06		40.15
		2)20.00		20.03		20.075
		10.0000		10.015		10.0375
		10.0150				
		10.0375				
		3)30.0525				
		10.0175	Velocity with a Motive Weight of 95 lbs.			

Conductor, with the Short Friction Plank, the centre being immersed six feet. N. B. The area of the Long Friction Plank exceeds the area of the Short one by fifty feet.



Length a z = 1 foot 3 inches. Depth a a = 1 foot.

	Motive Weights.										
	3	6	12	24	36	48	60	72	95	119	143
Velocity per Experiment	.....	2.5378	3.5283	5.2216	6.4825	7.4916	8.3687	9.2775	.....	.....	.....
Correction for Line	.....	2.5439	3.5463	5.2482	6.5220	7.5374	8.4198	9.3342	.....	.....	.....
Hutt. Correction, or Regular Series	1.7696	2.5463	3.6638	5.2717	6.5220	7.5852	8.5278	9.3843	10.854	12.217	13.454

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights ...	1.0113	3.7874	8.2000	14.184	21.698	30.709	41.193	53.124	66.488	81.266	97.446	115.02	144.50

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
6 and	12	2.0864											
	24	1.9143	12..24	1.7684									
	36	1.9031	36	1.8031	24..36	1.8660							
	48	1.9145	48	1.8387	48	1.9148	36..48	1.9882					
	60	1.9238	60	1.8613	60	1.9384	60	2.0001	48..60	2.0156			
	72	1.9115	72	1.8514	72	1.9079	72	1.9334	72	1.8964	60..72	1.7684	

21)40.0057

Mean 6 lbs. and 36 lbs. 1.9050

Digitized by Google

FRIDAY, October 14, 1796.

Conductor, with the Short Friction Plank, the centre being immersed six feet.

Thermometer in the Air, 60°;—In the Dock, 53°.—Water in the Dock, 11 feet 5 inches.—Calm.

System Four-fold.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accelerating Wt. 7 lbs.			Accel. Wt. 7 lbs.		Accel. Wt. 7 lbs.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	1.87	1.87	1.40	1.40	1.55	1.55
8	6.70	4.83	5.67	4.27	6.02	4.47
12	13.71	7.01	12.21	6.54	12.75	6.73
16	22.27	8.56	20.52	8.31	21.07	8.32
20	31.91	9.64	29.90	9.38	30.47	9.40
24	41.95	10.04	39.70	9.80	40.25	9.78
28	52.30	10.35	49.70	10.00	50.20	9.95
32	62.44	10.14	59.66	9.96	60.13	9.93
36	72.51	10.07	69.59	9.93	70.04	9.91
40	82.59	10.08	79.59	10.00	79.97	9.93
44	92.68	10.09	89.44	9.85	89.96	9.99
48	102.76	10.08	99.41	9.97	99.96	10.00
52	112.92	10.16	109.46	10.05	110.01	10.05
56	123.08	10.16	119.48	10.02	120.09	10.08
60	133.27	10.19	129.57	10.09	130.19	10.10
64	143.50	10.23*	139.70	10.13*	140.31	10.12*
68	153.67	10.17	149.83	10.13	150.47	10.16
72	163.82	10.15	159.98	10.15	160.59	10.12
		3)30.55		30.41		30.40
		4)10.1833		10.1366		10.1333
		2.5458		2.5341		2.5333
		2.5341				
		2.5331				
		3)7.6130				
		2.5377 Velocity with a Motive Weight of 6 lbs.				

TUESDAY, October 11, 1796.

Conductor, with the Short Friction Plank, &c.

Thermometer in the Air, 53°;—In the Dock, 54°.—Water in the Dock, 11 ft. 10 in.—Wind, N. W. Fresh Breeze.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 drs. Motive Weight 12 lbs.						
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.95	6.95	6.27	6.27	4.62	4.62
8	19.91	12.96	20.06	13.79	17.48	12.86
12	34.32	14.41	35.87	15.81	32.88	15.40
16	48.53	14.21	50.77	14.90	47.90	15.02
20	62.32	13.79	65.00	14.23	62.22	14.32
24	75.80	13.48	78.85	13.85	75.98	13.76
28	89.34	13.54	92.50	13.65	89.61	13.63
32	102.98	13.64	106.18	13.68	103.28	13.67
36	116.71	13.73	119.83	13.65	117.07	13.79
40	130.44	13.73	133.68	13.85	130.94	13.87
42	137.43	6.99	140.60	6.92	137.94	7.00
44	144.43	7.00	147.61	7.01	145.00	7.06
46	151.43	7.00	154.63	7.02	152.05	7.05
48	158.48	7.05*	161.67	7.04*	159.08	7.03*
50	165.51	7.03	168.72	7.05	166.15	7.07
52	172.61	7.10	175.78	7.06	173.23	7.08
		3)21.18		21.15		21.18
		2)7.06		7.05		7.06
		3.530		3.525		3.53
		3.525				
		3.530				
		3)10.585				
		3.5283 Velocity with a Motive Weight of 12 lbs.				

TUESDAY, October 11, 1796.

Conductor, with the Short Friction Plank, &c.

System Four-fold.

Total Weight 99 lbs. 2 oz. Motive Weight 24 lbs.						
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.21	7.21	4.65	4.65	4.60	4.60
8	24.36	17.15	20.70	16.05	20.50	15.90
12	44.28	19.92	40.22	19.52	40.23	19.73
16	64.37	20.09	60.35	20.13	60.32	20.09
20	84.61	20.24	80.72	20.37	80.51	20.19
24	105.14	20.53	101.21	20.49	100.92	20.41
26	115.41	10.27	111.60	10.39	111.24	10.32
28	125.82	10.41	122.00	10.40	121.51	10.27
30	136.32	10.50	132.51	10.51	131.92	10.41
32	146.75	10.43	142.98	10.47	142.25	10.33
34	157.20	10.45*	153.48	10.50*	152.68	10.43
36	167.61	10.41	163.98	10.50	163.05	10.37*
38	.....	.....	.....	.....	173.48	10.43
		2)20.86		21.00		20.80
		2)10.43		10.50		10.40
		5.215		5.25		5.20
		5.250				
		5.200				
		3)15.665				
		5.2216 Velocity with a Motive Weight of 24 lbs.				

TUESDAY, October 11, 1796.

Conductor, with the Short Friction Plank, &c.

System Four-fold.

Total Wt. 147 lbs. 14 oz.			Motive Wt. 36 lbs.	
Accel. Wt. Chain		ft. in. 12 6	A. Wt. Chain	ft. in. 12 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.07	1.07	1.40	1.40
4	7.24	6.17	6.98	5.58
6	17.03	9.79	17.28	10.30
8	29.07	12.04	29.70	12.42
10	41.98	12.91	42.64	12.94
12	54.93	12.95	55.57	12.93
14	67.77	12.84	68.38	12.81
16	80.65	12.88	81.16	12.78
18	93.25	12.60	93.95	12.79
20	106.07	12.82	106.72	12.77
22	118.90	12.83	119.58	12.86
24	131.85	12.95	132.51	12.93
26	144.79	12.94*	145.48	12.97
28	157.77	12.98	158.49	13.01*
30	.....	.....	171.42	12.93
		2)25.92		25.94
		2)12.96		12.97
		6.480		6.485
		6.485		
		2)12.965		
		6.4825 Velocity with a Motive Weight of 36 lbs.		

WEDNESDAY, October 12, 1796.

Conductor, with the Short Friction Plank, &c.

Thermometer in the Air, 55°;—In the Dock, 53°.—Water in the Dock, 11 feet 7 inches.—Wind, W. N. W. Fresh Breeze.

System Four-fold.

Total Weight 196 lbs. 10 oz. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A.W. Chain ft. 12 in. 6		A.W. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.00	2.00	8.82	8.82	2.60	2.60
4	11.80	9.80	20.71	11.89	11.47	8.27
6	24.70	12.90	34.91	14.20	24.23	12.76
8	39.22	14.52	50.16	15.25	38.97	12.74
10	53.75	14.53	65.40	15.24	54.38	15.41
12	68.48	14.73	80.40	15.00	69.60	15.22
14	83.20	14.72	95.31	14.91	84.80	15.20
16	97.96	14.76	110.30	14.99	99.71	14.91
18	112.90	14.94	125.29	14.99	114.80	15.09
20	127.90	15.00	140.34	15.05	129.79	14.99
22	142.83	14.93	155.33	14.99*	144.82	15.03*
24	157.76	14.93*	170.36	15.03	159.80	14.98
26	172.70	14.94	.....	.....	.....	.....
		2)29.87		30.02		30.01
		2)14.935		15.01		15.005
		7.4675		7.505		7.5025
		7.5050				
		7.5025				
		3)22.4750				
		7.4916 Velocity with a Motive Weight of 48 lbs.				

The first of these experiments was made October 11th.

WEDNESDAY, October 12, 1796.

Conductor, with the Short Friction Plank, &c.

System Four-fold.

Total Wt. 245 lbs. M. Wt. 60 lbs.				
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.60	1.60	2.51	2.51
4	10.30	8.70	12.00	9.49
6	23.80	13.50	25.90	13.90
8	39.89	16.09	41.98	16.08
10	56.78	16.89	58.76	16.78
12	73.85	17.07	75.28	16.52
14	90.60	16.75	91.90	16.62
16	107.48	16.88	108.39	16.49
18	124.20	16.72	124.90	16.51
20	140.99	16.79*	141.56	16.66*
22	157.67	16.68	158.38	16.82
		2)33.47		33.48
		2)16.735		16.74
		8.3675		8.37
		8.3700		
		2)16.7375		
		8.3687 Velocity with a Motive Wt. of 60 lbs.		

System Four-fold.

Total Wt. 293 lbs. 6 oz. M. Wt. 72 lbs.				
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.80	2.80	3.70	3.70
4	13.61	10.81	15.23	11.53
6	29.09	15.48	31.33	16.10
8	46.82	17.73	49.33	18.00
10	65.22	18.40	68.00	18.67
12	83.90	18.68	86.62	18.62
14	102.22	18.32	105.26	18.64*
16	120.83	18.61*	123.80	18.54
18	139.26	18.43	.....	.....
		2)37.04		37.18
		2)18.52		18.59
		9.260		9.295
		9.295		
		2)18.555		
		9.2775 Velocity with a Motive Wt. of 72 lbs.		

GENERAL TABLE, 1796.

	Page.	Feet per Second.												
		1	2	3	4	5	6	7	8	9	10	11	12	13.527
Conductor and Bars.....	325	0.7647	2.8392	6.1157	10.541	16.080	22.705	30.397	39.134	48.904	59.695	71.495	84.292	105.74
..... APa.....	334	0.5463	1.9545	4.1180	6.987	10.528	14.715	19.530	24.958	30.985	37.596	44.790	52.540	65.46
..... APl.....	342	0.6340	2.2585	4.746	8.037	12.091	16.880	22.379	28.573	35.443	42.98	51.16	59.97	74.65
..... APk	345	0.5816	2.1579	4.646	8.007	12.211	17.240	23.076	29.711	37.127	45.32	54.27	63.98	80.25
..... APe.....	349	0.5673	2.1571	4.710	8.198	12.600	17.900	24.088	31.152	39.085	47.88	57.52	68.01	85.65
..... APi.....	356	0.6341	2.3846	5.175	8.967	13.736	19.460	26.123	33.722	42.233	51.66	61.97	73.18	91.99
..... EPa.....	361	0.6233	2.2308	4.701	7.979	12.023	16.807	22.308	28.511	35.380	42.96	51.17	60.03	74.80
..... KPa.....	371	0.6062	2.1848	4.625	7.873	11.893	16.660	22.151	28.353	35.250	42.83	51.08	59.96	74.73
..... LPa.....	376	0.5727	2.0922	4.463	7.641	11.595	16.302	21.742	27.906	34.778	42.35	50.61	59.53	74.46
..... IPa	381	1.0833	4.2024	9.354	16.413	25.382	36.240	48.972	63.58	80.01	98.29	118.40	140.31	177.27
..... IPi.....	392	1.1506	4.5447	10.143	17.926	27.874	39.977	54.224	70.62	89.12	109.76	132.50	157.36	199.37
Long Friction Plank.....	397	1.1984	4.4986	9.7522	16.885	25.848	36.604	49.125	63.384	79.357	97.026	116.38	137.41	172.68
Short Friction Plank	405	1.0113	3.7874	8.2000	14.184	21.698	30.709	41.193	53.124	66.488	81.266	97.45	115.02	144.50
Friction on 50 feet.....	397	0.1871	0.7112	1.5522	2.701	4.150	5.895	7.932	10.260	12.869	15.760	118.93*	22.39	28.18

* Query 18.93?

Digitized by Google

Conductor, with round iron bar, immersed 5 feet 6 inches.

	Feet	In.
Length a z	25	10
Breadth a a or z z	1	0
Depth x y	1	0
Slant a y or z y..	6	0

Diameter of Bar, 2¼ Inches.

	Motive Weights.						
	6	12	24	36	48	60	72
Velocity per Experiment.....	2.5229	3.6816	5.4533	7.2328	8.4889	9.4491	10.467
Correction for Line	2.5289	3.7004	5.4811	7.2769	8.5408	9.5068	10.554
Hutt. Correction, or Regular Series	2.5369	3.7759	5.6202	7.0914	8.3639	9.5059	10.554

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights ..	1.1841	3.9641	8.0368	13.268	19.577	26.898	35.189	44.408	54.543	65.541	77.387	90.061	110.97

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
6 and	12	1.8209											
	24	1.7921	12..24	1.7643									
	36	1.6953	36	1.6245	24..36	1.4307							
	48	1.7086	48	1.6574	48	1.5628	36..48	1.7964					
	60	1.7389	60	1.7057	60	1.6638	60	1.9110	48..60	2.0825			
	72	1.7393	72	1.7096	72	1.6768	72	1.8643	72	1.9157	60..72	1.7447	

21)36.6053

Mean 60 lbs. and 72 lbs. 1.7431

FRIDAY, August 18, 1797.

Conductor, with round iron bar, immersed 5 feet 6 inches.

Thermometer in the Air, 78°;—In the Dock, 69°.—Water in the Dock, 10 feet.—Wind, S. W. Strong Breeze.

System Four-fold, Line No. 4.

Total Weight 24 lbs. 12 oz. 1 dr. Motive Weight 6 lbs.						
Accel. Wt. Chain, none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.04	3.04	2.69	2.69	2.73	2.73
8	8.24	5.20	7.50	4.81	7.80	5.07
12	14.86	6.62	13.89	6.39	14.37	6.57
16	22.66	7.80	21.48	7.59	22.24	7.87
20	31.34	8.68	30.00	8.52	31.00	8.76
24	40.54	9.20	39.04	9.04	40.48	9.48
28	50.09	9.55	48.60	9.56	50.10	9.62
32	59.90	9.81	58.32	9.72	60.06	9.96
36	69.99	10.09	68.28	9.96	70.10	10.04
40	80.08	10.09	78.20	9.92	80.28	10.18
44	90.33	10.25	88.34	10.14	90.52	10.24
48	100.58	10.25	98.44	10.10	100.70	10.18
52	110.88	10.30	108.53	10.09	110.90	10.20
56	121.00	10.12	118.61	10.08	121.02	10.12
60	131.22	10.22	128.70	10.09	126.16	5.14
64	141.30	10.08*	133.72	5.02	131.25	5.09*
68	151.38	10.08	138.78	5.06	136.27	5.02
70	.....	.....	143.81	5.03*	141.30	5.03
72	.....	.....	148.85	5.04	146.38	5.08
74	.....	.....	153.90	5.05	.....	.....
76	.....	.....	158.95	5.05	.....	.....
		2)20.16		4)20.17		20.22
		4)10.08		2)5.0425		5.055
		2.5200		2.5212		2.5275
		2.5212				
		2.5275				
		3)7.5687				
		2.5229 Velocity with a Motive Weight of 6 lbs.				

FRIDAY, August 18, 1797.

Conductor, with round iron bar, immersed 5 feet 6 inches.

System Four-fold. Line No. 3.

Total Wt. 49 lbs. 11 oz. 8 drs. M. Wt. 12 lbs.				
Accel. Wt. Chain ft. 6			A. Wt. Chain ft. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
4	10.11	10.11	4.62	4.62
8	23.40	13.29	16.07	11.45
12	38.36	14.96	30.28	14.21
16	52.76	14.40	44.67	14.39
20	67.09	14.33	59.24	14.57
24	81.57	14.48	73.77	14.53
28	96.00	14.43	88.20	14.43
32	110.60	14.60	102.79	14.59
36	125.26	14.66	117.30	14.51
38	132.10	6.84	131.96	14.66
40	139.90	7.80	139.37	7.41
42	147.30	7.40	146.70	7.33
44	154.60	7.30*	154.10	7.40*
46	161.86	7.26	161.40	7.30
48	169.28	7.42	168.90	7.50
		3)21.98		22.20
		2)7.3266		7.40
		3.6633		3.70
		3.7000		
		2)7.3633		
		3.6816 Velocity with a Motive Weight of 12 lbs.		

FRIDAY, August 18, 1797.

Conductor, with round iron bar, immersed 5 feet 6 inches.

System Four-fold. Line No. 3.

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.

	Accel. Wt. Chain 5 ft.		A. Wt. Chain 5 ft.		A. Wt. Chain 5 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.38	2.38	4.77	4.77	3.08	3.08
4	8.07	5.69	11.58	6.81	8.96	5.88
6	15.78	7.71	20.20	8.62	16.83	7.87
8	24.85	9.07	29.60	9.40	25.91	9.08
10	34.49	9.64	39.71	10.11	35.79	9.88
12	44.83	10.34	50.20	10.49	45.92	10.13
14	55.37	10.54	60.86	10.66	56.50	10.58
16	66.29	10.92	71.77	10.91	67.12	10.62
18	77.23	10.94	82.65	10.88	77.92	10.80
20	88.32	11.09	93.59	10.94	88.81	10.89
22	99.31	10.99	104.57	10.98	99.78	10.97
24	110.34	11.03	115.58	11.01	110.68	10.90
26	121.35	11.01	126.51	10.93	121.56	10.88
28	132.49	11.14	137.40	10.89*	132.46	10.90
30	143.40	10.91*	148.40	11.00	143.38	10.92*
32	154.27	10.87	159.30	10.90	154.20	10.82
34	165.22	10.95	.....	.....	165.10	10.90
		3)32.73		32.79		32.64
		2)10.91		10.93		10.88
		5.455		5.465		5.44
		5.465				
		5.440				
		3)16.360				
		5.4533 Velocity with a Motive Weight of 24 lbs.				

FRIDAY, August 18, 1797.

Conductor, with round iron bar, immersed 5 feet 6 inches.

System Four-fold. Line No. 2.

Total Weight 148 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain ft. 7			A. Wt. Chain ft. 7		A. Wt. Chain ft. 7	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.17	3.17	4.17	4.17	6.82	6.82
4	10.34	7.17	11.83	7.66	15.99	9.17
6	20.40	10.06	22.16	10.33	27.10	11.11
8	31.89	11.49	33.81	11.65	39.37	12.27
10	44.38	12.49	46.34	12.53	52.20	12.83
12	57.35	12.97	59.35	13.01	65.57	13.37
14	70.94	13.59	72.60	13.25	78.99	13.42
16	84.72	13.78	86.30	13.70	92.88	13.89
18	98.78	14.06	100.28	13.98	107.01	14.13
20	113.19	14.41	114.58	14.30	121.47	14.46
22	127.60	14.41	128.82	14.24*	135.90	14.43*
24	142.16	14.56*	143.24	14.42	150.42	14.52
26	156.57	14.41	157.70	14.46	164.92	14.50
28	171.22	14.65	.....	.....	.....	.....
		2)43.62		43.12		43.45
		2)14.54		14.3733		14.4833
		7.2700		7.1866		7.2416
		7.1866				
		7.2416				
		3)21.6982				
		7.2327 Velocity with a Motive Weight of 36 lbs.				

FRIDAY, August 18, 1797.

Conductor, with round iron bar, immersed 5 feet 6 inches.

System Four-fold. Line No. 2.

Total Weight 197 lbs. Motive Weight 48 lbs.								
Accel. Wt. Chain ft. 6			A. Wt. Chain ft. 6		A. Wt. Chain ft. 6		A. Wt. Chain ft. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.35	2.35	6.82	6.82	4.50	4.50	3.51	3.51
4	9.61	7.26	16.89	10.07	13.37	8.87	11.62	8.11
6	20.32	10.71	29.74	12.85	25.48	12.11	23.12	11.50
8	33.12	12.80	43.89	14.15	39.29	13.81	36.63	13.51
10	47.56	14.44	59.39	15.50	54.34	15.05	51.35	14.72
12	62.91	15.35	75.29	15.90	70.00	15.66	66.88	15.53
14	78.99	16.08	92.00	16.71	86.48	16.48	83.29	16.41
16	95.45	16.48	108.70	16.70	103.19	16.71	99.86	16.57
18	112.27	16.80	125.72	17.02	120.10	16.91	116.90	17.04
20	129.09	16.82	142.78	17.06*	137.12	17.02*	133.89	16.99*
22	146.23	17.14*	159.80	17.02	154.00	16.88	150.88	16.99
24	163.10	16.87	.....	.....	170.78	16.78	167.82	16.94
		2)34.01		34.08		3)50.68		50.92
		2)17.005		17.04		16.8933		16.9733
		8.5025		8.52		8.4466		8.4866
		8.5200						
		8.4466						
		8.4866						
		4)33.9557						
		8.4889 Velocity with a Motive Weight of 48 lbs.						

FRIDAY, August 18, 1797.

Conductor, with round iron bar, immersed 5 feet 6 inches.

System Four-fold. Line No. 2.

Total Weight 246 lbs. Motive Weight 60 lbs.						
Accel. Wt. Chain 6 ft			A. Wt. Chain 6 ft		A. Wt. Chain 7 ft	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.16	8.16	6.72	6.72	2.30	2.30
4	20.52	12.36	18.20	11.48	11.02	8.72
6	36.12	15.60	32.78	14.58	24.07	13.05
8	52.89	16.77	49.41	16.63	39.97	15.90
10	71.10	18.21	67.00	17.59	57.37	17.40
12	89.60	18.50	85.46	18.46	75.42	18.05
14	108.54	18.94	104.17	18.71	94.31	18.89
16	127.27	18.73	122.93	18.76	113.19	18.88
18	146.05	18.78*	141.72	18.79*	132.17	18.98
20	165.09	19.04	160.67	18.95	151.10	18.93*
22	.....	.....	.....	.....	170.00	18.90
		2)37.82		37.74		37.83
		2)18.91		18.87		18.915
		9.4550		9.435		9.4575
		9.4350				
		9.4575				
		3)28.3475				
		9.4491 Velocity with a Motive Weight of 60 lbs.				

MONDAY, September 4, 1797.

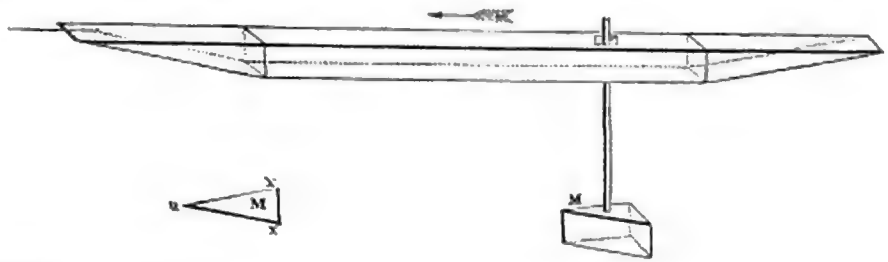
Conductor, with round iron bar, immersed 5 feet 6 inches.

Thermometer in the Air, 63°;—In the Dock, 65°.—Water in the Dock, 12 feet 6 inches.—Calm.

System Four-fold. Line No. 1.

Total Weight 294 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain 14 ft.			A. Wt. Chain 14 ft.		A. Wt. Chain 14 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.60	6.60	1.34	1.34	1.10	1.10
4	19.95	13.35	10.61	9.27	7.12	6.02
6	37.70	17.75	25.75	15.14	20.95	13.83
8	57.30	19.60	44.28	18.53	38.62	17.67
10	77.30	20.00	63.75	19.47	58.15	19.53
12	97.55	20.25	83.90	20.15	78.15	20.00
14	118.08	20.53	104.37	20.47	98.40	20.25
16	139.05	20.97*	125.00	20.63	119.21	20.81
18	159.89	20.84	146.05	21.05*	140.04	20.83*
20	.....	.....	167.09	21.04	160.92	20.88
		2)41.81		42.09		41.71
		2)20.905		21.045		20.855
		10.4525		10.5225		10.4275
		10.5225				
		10.4275				
		3)31.4025				
		10.4675 Velocity with a Motive Weight of 72 lbs.				

Conductor, with round iron bar and triangle M, vertex foremost, the centre of the triangle being immersed six feet.



∠ of incidence, 9° 35′ 38″. x u = 3 feet. x x = 1 foot.

	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	3.0137	4.3475	5.4337	6.4581	.....	8.2425	.....	.....
Correction for Line.....	.....	3.0290	4.3696	5.4668	6.4974	.....	8.3109	.....	.....
Hutt. Correction, or Regular Series.	2.0277	3.0055	4.4545	5.6075	6.6026	7.4938	8.3109	9.7853	11.106

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.7614	5.8556	11.962	19.856	29.416	40.553	53.211	67.323*	82.847	99.743	117.98	137.52	169.82
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.408	54.543	65.541	77.39	90.06	110.97
Resistance and Friction....	0.5773	1.8915	3.925	6.588	9.839	13.655	18.022	22.925	28.304	34.202	40.59	47.46	58.85

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
12 and	24	1.8916							
	36	1.8606	24..36	1.8100					
	48	1.8165	48	1.7471	36..48	1.6658			
	72	1.7752	72	1.7088	72	1.6934	48..72	1.6471	

10) 17.6161

Mean 12 lbs. and 72 lbs.. 1.7616

* *Should be 67.333?*

FRIDAY, October, 27, 1797.

Conductor, with round iron bar and Triangle M, vertex foremost, the centre of the triangle being immersed six feet.

Thermometer in the Air, 46°;—In the Dock, 48½°.—
Water in the Dock, 12 feet 3 inches.—Calm.

System Four-fold. Line No. 3.

T. Wt. 49 lbs. 11 oz. 8 drs. M. Wt. 12 lbs.

Accel. Wt. Chain ft. 8 in. 6			A. Wt. Chain ft. 8 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.30	4.30	5.20	5.20
8	15.10	10.80	16.50	11.30
12	27.93	12.83	29.50	13.00
16	40.70	12.77	42.23	12.73
20	53.05	13.35†	54.52	12.29
24	65.04	11.99	66.57	12.05
28	77.03	11.99	78.50	11.93
32	88.90	11.87	90.35	11.85
36	100.78	11.88	102.15	11.80
40	112.70	11.92	113.97	11.82
42	118.61	5.91	119.90	5.93
44	124.63	6.02	125.82	5.92
46	130.64	6.01	131.87	6.05
48	136.65	6.01	137.80	5.93
50	142.70	6.05	143.89	6.09
52	148.70	6.00	149.85	5.96
54	154.77	6.07*	155.88	6.03*
56	160.80	6.03	161.88	6.00
58	166.85	6.05	167.88	6.00
60	172.89	6.04	173.88	6.00
		4)24.19		24.03
		2)6.0475		6.0075
		3.0237		3.0037
		3.0037		
		2)6.0274		
		3.0137 Velocity with a Motive Wt. of 12 lbs.		

† Should be 12.35?

System Four-fold. Line No. 3.

Total Wt. 99 lbs. 12 oz. Motive Wt. 24 lbs.

Accel. Wt. Chain ft. 9 in. 6			A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.
4	10.70	10.70	6.47	6.47
8	27.60	16.90	21.63	15.16
12	44.80	17.20	39.31	17.68
16	62.20	17.40	56.98	17.67
20	79.54	17.34	74.35	17.37
22	88.19	8.65	91.79	17.44
24	96.79	8.60	100.53	8.74
26	105.45	8.66	109.30	8.77
28	114.05	8.60	118.05	8.75
30	122.70	8.65	126.75	8.70
32	131.50	8.80	135.54	8.79
34	140.11	8.61*	144.30	8.76*
36	148.83	8.72	153.00	8.70
38	157.50	8.67	161.67	8.67
40	166.25	8.75	170.35	8.68
		4)34.75		34.81
		2)8.6875		8.7025
		4.3437		4.3512
		4.3512		
		2)8.6950		
		4.3475 Velocity with a Motive Wt. of 24 lbs.		

FRIDAY, October 27, 1797.

Conductor, with round iron bar and triangle M, vertex foremost, &c.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain ft. 10 in. 6			A. Wt. Chain ft. 11 in. 6		A. Wt. Chain ft. 11 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.50	1.50	4.60	4.60	5.46	5.46
4	7.15	5.65	12.40	7.80	13.91	8.45
6	15.65	8.50	22.20	9.80	23.94	10.03
8	25.60	9.95	32.85	10.65	34.73	10.79
10	36.10	10.50	43.59	10.74	45.68	10.95
12	46.80	10.70	54.30	10.71	56.19	10.51
14	57.41	10.61	64.90	10.60	66.75	10.56
16	68.00	10.59	75.58	10.68	77.34	10.59
18	78.63	10.63	86.18	10.60	87.95	10.61
20	89.18	10.55	96.83	10.65	98.74	10.79
22	99.85	10.67	107.60	10.77	109.44	10.70
24	110.55	10.70	118.44	10.84	120.25	10.81
26	121.28	10.73	129.30	10.86	130.99	10.74
28	132.09	10.81*	140.10	10.80*	141.88	10.89*
30	142.90	10.81	150.90	10.80	152.78	10.90
32	153.87	10.97	161.74	10.84	163.74	10.96
34	164.75	10.88	172.63	10.89	174.60	10.86
		4) 43.47		43.33		43.61
		2) 10.8675		10.8325		10.9025
		5.4337		5.4162		5.4512
		5.4162				
		5.4512				
		3) 16.3011				
		5.4337 Velocity with a Motive Weight of 36 lbs.				

FRIDAY, October 27, 1797.

Conductor, with round iron bar and triangle M, vertex foremost, &c.

Thermometer in the Air, 53°;—In the Dock, 56°.—
Water in the Dock, 12 ft. 3 in.—Wind, N. Fresh Breeze.

System Four-fold.

Total Wt. 197 lbs. Motive Wt. 48 lbs.				
Accel. Wt. Chain ft. 11 in. 6			A. Wt. Chain ft. 11 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.66	1.66	4.30	4.30
4	8.38	6.72	12.65	8.35
6	18.32	9.94	23.61	9.96
8	29.92	11.60	35.90	12.29
10	42.30	12.38	48.30	12.40
12	54.95	12.65	61.00	12.70
14	67.58	12.63	73.60	12.60
16	80.35	12.77	86.36	12.76
18	93.02	12.67	99.15	12.79
20	105.90	12.88	112.00	12.85
22	118.71	12.81	124.95	12.95*
24	131.60	12.89*	137.84	12.89
26	144.50	12.90	150.79	12.95
28	157.40	12.90	163.72	12.93
30	170.32	12.92	.....	.....

4)51.61 — 51.72

2)12.9025 — 12.93

6.4512 — 6.465
6.4650

2)12.9162

6.4581 Velocity with a Motive Wt. of 48 lbs.

SATURDAY, October 14, 1697.

System Four-fold.

Total Wt. 294 lbs. Motive Wt. 72 lbs.				
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.00	2.00	9.06	9.06
4	10.45	8.45	22.15	13.09
6	23.14	12.69	37.60	15.45
8	38.59	15.45	53.54	15.94
10	54.37	15.98	69.53	15.99
12	70.44	15.87	85.75	16.22
14	86.46	16.02	102.19	16.44
16	102.29	15.83	118.63	16.44
18	118.74	16.45	135.09	16.46*
20	135.25	16.51*	.....	.....

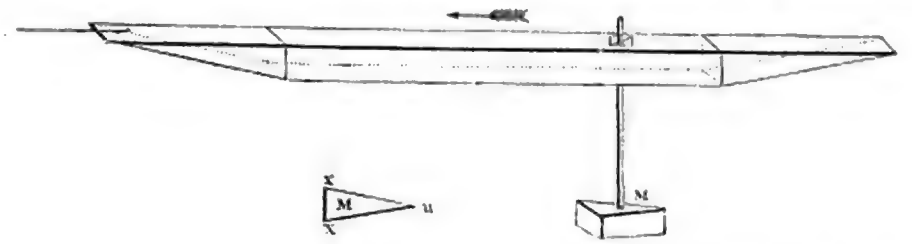
2)16.51 — 16.46

8.255 — 8.23
8.230

2)16.485

8.2425 Velocity with a Motive Wt. of 72 lbs.

Conductor, with round iron bar and triangle M, base foremost, the centre of the triangle being immersed six feet.



x u = 3 feet. x x = 1 foot. ∠ of incidence, 9° 35′ 38″.

	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	.....	3.560	.....	5.0475	.....	6.1793	7.3275	8.1950
Correction for Line	.....	.....	3.5781	.....	5.0782	.....	6.2306	7.3883	8.2630
Hutt. Correction, or Regular Series	1.7173	2.4732	3.5619	4.4093	5.1300	5.7692	6.3502	7.3883	8.3085

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	2.1474	8.0159	17.320	29.917	45.715	64.643	86.641	111.68	139.69	170.65	204.53	241.29	302.96
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.41	54.54	65.54	77.39	90.06	110.97
Resistance and Friction	0.9633	4.0518	9.283	16.649	26.138	37.745	51.452	67.27	85.15	105.11	127.14	151.23	191.99

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
24 and 48	1.9797								
72	1.9808	48..72	1.9826						
96	1.9120	96	1.8487	72..96	1.6880				
120	1.9230	120	1.8821	120	1.8094	96..120	1.9943		

10) 19.0006

Mean 24 lbs. and 96 lbs. 1.9001

Digitized by Google

SATURDAY, October 28, 1797.

Conductor, with round iron bar and triangle M, base foremost, &c.

Thermometer in the Air, 48°;—In the Dock, 50°.—Water in the Dock, 12 ft. 6 in.—Wind, E.N.E. Moderate.

System Four-fold.

Total Wt. 99 lbs. 12 oz.			M. Wt. 24 lbs.	
Accel. Wt. Chain 4 ft. 3 in.			A. Wt. Chain 4 ft. 3 in.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.26	5.26	6.84	6.84
8	12.11	6.85	19.05	12.21
12	30.64	8.53	32.70	13.65
16	44.54	13.90	46.58	13.88
20	58.49	13.95	61.35	14.77
24	72.70	14.21	74.75	13.40
28	86.80	14.10	88.78	14.03
32	101.00	14.20	102.78	14.00
36	115.24	14.24	116.94	14.16
38	122.30	7.06	124.05	7.11
40	129.45	7.15	131.05	7.00
42	136.52	7.07*	138.15	7.10*
44	143.62	7.10	145.29	7.14
46	150.72	7.10	152.45	7.16
48	157.87	7.15	159.59	7.14
		4)28.42		28.54
		2)7.105		7.135
		3.5525		3.5675
		3.5675		
		2)7.1200		
		3.5600	Velocity with a Motive Weight of 24 lbs.	

SATURDAY, October 28, 1797.

Conductor, with round iron bar and triangle M, &c.

System Four-fold.

Total Weight 197 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 7 in. 6			A. Wt. Chain ft. 7 in. 6		A. Wt. Chain ft. 7 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	13.87	13.87	13.64	13.64	12.30	12.30
8	33.07	19.27	32.97	19.33	31.43	19.13
12	52.85	19.78	52.74	19.77	51.20	19.77
16	71.51	18.66	72.50	19.76	71.00	19.80
20	93.04	21.53	92.51	20.01	90.95	19.95
22	103.16	10.12	102.65	10.15	100.96	10.01
24	113.22	10.06	112.70	10.05	110.97	10.01
26	123.39	10.18	122.80	10.10	121.03	10.06
28	133.49	10.10	132.87	10.07*	131.15	10.12*
30	143.70	10.21	143.03	10.16	141.15	10.00
32	153.62	9.92	153.09	10.06	151.20	10.05
34	163.78	10.16*	163.11	10.02	161.30	10.10
36	173.90	10.12	.....	.....	.....	.....
		2)20.28		4)40.31		40.27
		2)10.14		10.0775		10.0675
		5.0700		5.0387		5.0337
		5.0387				
		5.0337				
		3)15.1424				
		5.0475 Velocity with a Motive Weight of 48 lbs.				

FRIDAY, October 27, 1797.

Conductor, with round iron bar and triangle M, base foremost, &c.

Thermometer in the Air, 46°;—In the Dock, 48½°.—Water in the Dock, 12 feet 3 inches.—Calm.

System Four-fold.

Total Weight 294 lbs.			Motive Wt. 72 lbs.	
Accel. Wt. Chain	ft. 8	in. 6	A. Wt. Chain	ft. 8 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.05	3.05	2.89	2.89
4	11.37	8.32	11.11	8.22
6	22.28	10.91	22.10	10.99
8	33.90	11.62	33.90	11.80
10	45.75	11.85	46.05	12.15
12	57.64	11.89	58.15	12.10
14	69.75	12.11	70.39	12.24
16	81.75	12.00	82.69	12.30
18	93.90	12.15	65.00	12.31
20	106.18	12.28	107.25	12.25
22	118.60	12.42	119.75	12.50
24	130.90	12.30*	132.10	12.35*
26	143.12	12.22	144.62	12.52
28	155.48	12.36	156.90	12.28
30	167.87	12.39	169.35	12.45
		4)49.27		49.60
		2)12.3175		12.40
		6.1587		6.20
		6.2000		
		2)12.3587		
		6.1793	Velocity with a Motive Weight of 72 lbs.	

FRIDAY, October 27, 1797. SATURDAY, October 28, 1797.

Conductor, with round iron bar and triangle M, base foremost, &c.

Thermometer in the Air, 48°;—In the Dock, 50°.—Water in the Dock, 12 feet 6 inches.—Wind, E. N. E. Moderate.

System Four-fold.

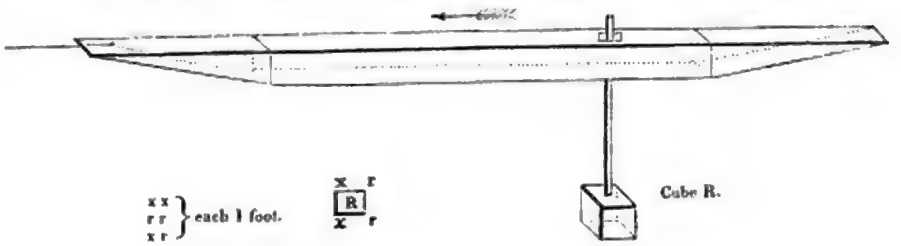
Total Wt. 395 lbs. Motive Wt. 96 lbs.				
Accel. Wt. Chain ft. 8 in. 6			A. Wt. Chain ft. 8 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.15	2.15	2.90	2.90
4	11.65	9.50	13.60	10.70
6	24.45	12.80	20.05	12.45
8	38.52	14.07	40.12	14.07
10	52.51	13.99	54.45	14.32
12	67.10	14.59	69.10	14.65
14	81.60	14.50	83.60	14.50
16	96.03	14.43	98.20	14.60
18	110.70	14.67	113.01	14.81*
20	125.40	14.70*	127.48	14.47
22	139.93	14.53	142.26	14.78
24	154.57	14.64	.....	.....
		3)43.87		44.06
		2)14.6233		14.6866
		7.3116		7.3433
		7.3434		
		2)14.6550		
		7.3275 Velocity with a Motive Wt. of 96 lbs.		

System Four-fold.

Total Wt. 489 lbs. Motive Wt. 120 lbs.				
Accel. Wt. Chain ft. 8 in. 4			A. Wt. Chain ft. 8 in. 4	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.90	2.90	6.97	6.97
4	14.43	11.53	20.10	13.93†
6	29.40	14.97	35.72	15.62
8	45.46	16.06	51.94	16.22
10	61.72	16.26	68.17	16.23
12	78.05	16.33	84.50	16.33
14	94.49	16.44	100.82	16.32
16	110.74	16.25	117.39	16.57*
18	127.09	16.35*	133.70	16.31
20	143.40	16.31	150.00	16.30
22	159.90	16.50	.....	.....
		3)49.16		49.18
		2)16.3866		16.3933
		8.1933		8.1966
		8.1967		
		2)16.3900		
		8.1950 Velocity with a Motive Wt. of 120 lbs.		

† Query 13.13?

Conductor, with round iron bar and cube R, immersed six feet.



	Motive Weights.									
	3	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	.....	2.4746	3.4889	4.2513	4.9812	.....	6.1537	.....	8.0575
Correction for Line	.....	.....	2.4872	3.5067	4.2773	5.0116	.....	6.2047	.....	8.1244
Hutt. Correction, or Regular Series	1.1989	1.7158	2.4558	3.5150	4.3352	5.0308	5.6463	6.2047	7.2003	8.0813

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	2.1128	8.0689	17.668	30.813	47.434	67.479	90.904	117.68	147.77	181.15	217.80	257.70	324.85
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.41	54.54	65.54	77.39	90.06	110.97
Resistance and Friction....	0.9287	4.1048	9.631	17.545	27.857	40.581	55.715	73.27	93.23	115.61	140.41	167.64	213.88

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
12 and	24	2.0178											
	36	2.0263	24..36	2.0411									
	48	1.9788		48	1.9411	36..48	1.8158						
	72	1.9600		72	1.9253		72	1.8634	48..72	1.8987			
	120	1.9452		120	1.9155		120	1.8767		120	1.8967	72..120	1.8951

15)28.9975

Mean 24 lbs. and 72 lbs. 1.9332

THURSDAY, September 7, 1797.

Conductor, with round iron bar and cube R, immersed six feet.

Thermometer in the Air, 72°;—In the Dock, 64°.—Water in the Dock, 13 feet.—Wind, West.—Light Breeze.

System Four-fold.

	Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.							
	Accel. Weight, Chain 8 ft.		Accel. Wt. Chain 8 ft.		A. Wt. Chain, none.		A. Wt. Chain, none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.14	7.14	7.04	7.04	4.64	4.64	3.80	3.80
8	18.11	10.97	18.27	11.23	12.02	7.38	10.52	6.72
12	29.29	11.18	29.75	11.48	20.61	8.59	18.89	8.37
16	39.31	10.02	39.80	10.05	29.80	9.19	27.99	9.10
20	49.11	9.80	49.71	9.91	39.07	9.27	37.18	9.19
24	58.75	9.64	59.45	9.74	48.44	9.37	46.69	9.51
28	68.35	9.60	69.05	9.60	57.85	9.41	56.07	9.38
32	77.90	9.55	78.65	9.60	67.37	9.52	65.67	9.60
36	87.56	9.66	88.35	9.70	77.01	9.64	75.25	9.58
40	97.21	9.65	98.05	9.70	86.61	9.60	84.93	9.68
44	106.85	9.64	107.75	9.70	96.30	9.69	94.75	9.82
48	116.61	9.76	117.60	9.85	105.95	9.65	104.39	9.64
52	126.39	9.78	127.41	9.81	115.73	9.78	113.99	9.60
56	136.05	9.66	137.29	9.78†	125.45	9.72	123.69	9.70
60	145.85	9.80	142.24	4.95	135.21	9.76	133.42	9.73
62	150.78	4.93	147.09	4.85	140.23	5.02	138.28	4.83‡
64	155.68	4.90*	152.00	4.91	145.10	4.87	143.19	4.94§
66	160.55	4.87	156.95	4.95*	150.03	4.93	148.10	4.91
68	165.55	5.00	161.92	4.97	154.98	4.95	153.08	4.98
70	170.50	4.95	166.85	4.93	159.94	4.96*	157.95	4.37††
72	.....	.....	171.75	4.90	164.87	4.93	162.92	4.97*
74	.....	.....	.....	.....	169.87	5.00	167.85	4.93
76	.....	.....	.....	.....	.....	.....	172.85	5.00
		4)19.72		19.75		3)14.89		14.90
		2)4.93		4.9375		4.9633		4.9666
		2.4650		2.4687		2.4816		2.4833
		2.4687						
		2.4816						
		2.4833						
		4)9.8986						
		2.4746 Velocity with a Motive Weight of 12 lbs.						

† Should be 9.88? ‡ Should be 4.86? § Should be 4.91? †† Should be 4.87?

N.B. The last two experiments were made on the 9th of September.

THURSDAY, September 7, 1797.

Conductor, with round iron bar and cube R, immersed six feet.

System Four-fold.

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.										
Accel. Wt. Chain 7 ft. 6 in.			A. Wt. Chain 8 ft.		A. Wt. Chain, none.		Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.60	8.60	8.38	8.38	7.05	7.05	5.78	5.78	3.33	3.33
8	22.97†	14.19	22.55	14.17	18.84	11.79	17.03	11.25	13.20	9.87
12	37.19	14.40	36.99	14.44	32.20	13.36	30.25	13.22	25.85	12.65
16	51.25	14.06	50.85	13.86	45.80	13.60	43.80	13.55	39.44	13.59
20	65.05	13.80	64.69	13.74‡	59.40	13.60	57.55	13.75	53.12	13.68
24	78.80	13.75	78.49	13.80	73.35	13.95	71.35	13.80	67.04	13.92
28	92.75	13.95	92.28	13.79	87.24	13.89	85.35	14.00	80.79	13.75
32	106.55	13.80	106.25	13.97	101.10	13.86	99.29	13.94	94.69	13.90
34	113.46	6.91	113.15	6.90	114.91	13.81	113.20	13.91	108.64	13.95
36	120.75§	6.89	120.10	6.95	128.97	14.06	127.11	13.91	122.55	13.91
38	127.20	6.85	127.05	6.95	135.94	6.97	134.08	6.97	136.40	13.85
40	134.11	6.91	134.03	6.98	142.77	6.83	140.95	6.87	143.44	7.04
42	141.01	6.90	141.03	7.00	149.80	7.03*	147.89	6.94*	150.35	6.91*
44	147.95	6.94	147.90	6.87	156.70	6.90	154.70	6.81	157.35	7.00
46	154.90	6.95*	154.85	6.95*	163.77	7.07	161.75	7.05	164.36	7.01
48	161.90	7.00	161.87	7.02	.....	.....	.....	.....	.....	.....
50	168.89	6.99	168.91	7.04	.....	.....	.....	.....	.....	.....
		3)20.94		21.01		21.00		20.80		20.92
		2)6.98		7.0033		7.00		6.9333		6.9733
		3.4900		3.5016		3.50		3.4666		3.4866
		3.5016								
		3.5000								
		3.4666								
		3.4866								
		5)17.4448								
		3.4889 Velocity with a Motive Weight of 24 lbs.								

† Should be 22.79? ‡ Should be 13.84? § Should be 120.35?

N.B. The last three experiments were made on the ninth of September, and with this Motive Weight the bodies rolled.

THURSDAY, September 7, 1797.

Conductor, with round iron bar, cube R, &c.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain ft. 9 in. 6			A. Wt. Chain ft. 9 in. 6		A. Wt. Chain ft. 9 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.25	2.25	2.00	2.00	1.29	1.29
4	13.10	7.85	5.75	3.75	6.40	5.11
6	21.95	8.85	13.70	7.95	14.20	7.80
8	30.87	8.92	22.48	8.78	22.75	8.85
10	39.40	8.53	31.24	8.76	31.64	8.89
12	48.00	8.60	39.63	8.39	40.08	8.44
14	56.39	8.39	47.82	8.19	48.40	8.32
16	64.81	8.42	56.00	8.18	56.70	8.30
18	73.18	8.37	64.29	8.29	64.98	8.28
20	81.50	8.32	72.55	8.26	73.29	8.31
22	89.85	8.35	80.69	8.14	81.50	8.21
24	98.30	8.45	89.10	8.41	89.85	8.35
26	106.82	8.52	97.45	8.35	98.19	8.34
28	115.20	8.38	105.90	8.45	106.55	8.36
30	123.60	8.40	114.38	8.48	114.90	8.35
32	132.00	8.40	122.89	8.51	123.35	8.45
34	140.59	8.59	131.29	8.40	131.80	8.45
36	149.15	8.56*	139.75	8.46	140.05	8.45
38	157.52	8.37	148.19	8.44*	148.55	8.50*
40	166.07	8.55	156.60	8.41	156.93	8.38
42	.....	.....	165.18	8.58	165.49	8.56
		3)25.48		25.43		25.44
		2)8.4933		8.4766		8.48
		4.2466		4.2388†		4.24

† Query 4.2383?

SATURDAY, September 9, 1797.

Conductor, with round iron bar, cube R, &c.

Thermometer in the Air, 62°;—In the Dock, 62½°.—Water in the Dock, 12ft. 9 in.—Wind, W.N.W. Fresh Breeze.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.						
Accel Wt. Chain, none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	9.90	9.90	4.38	4.38	6.69	6.69
8	25.18	15.28	17.63	13.25	21.10	14.41
12	41.35	16.17	33.75	16.12	37.07	15.97
16	57.68	16.33	49.98	16.23	53.46	16.39
20	74.52	16.84	66.57	16.59	69.89	16.43
24	91.09	16.57	83.20	16.63	86.51	16.62
28	107.75	16.66	99.93	16.73	103.29	16.78
30	116.14	8.39	116.68	16.75	111.70	8.41
32	124.75	8.61	125.15	8.47	120.07	8.37
34	133.22	8.47	133.56	8.41	128.49	8.42
36	141.75	8.53	142.00	8.44	136.93	8.44
38	150.30	8.55*	150.46	8.46*	145.46	8.53*
40	158.75	8.45	159.00	8.54	153.89	8.43
42	167.43	8.68	167.50	8.50	162.45	8.56
		3)25.68		25.50		25.52
		2)8.56		8.50		8.5066
		4.2800		4.25		4.2533
		4.2500				
		4.2533				
		4.2466				
		4.2388†				
		4.2400				
		6)25.5087				
		4.2514 Velocity with a Motive Weight of 36 lbs.‡				

† Query 4.2383?

‡ The bodies rolled with this Motive Weight.

SATURDAY, September 9, 1797.

Conductor, with round iron bar, cube R, &c.

System Four-fold.

Total Weight 197 lbs.			Motive Wt. 48 lbs.	
Accel. Wt. Chain 8 ft.			A. Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.85	2.85	4.91	4.91
4	9.67	6.82	13.29	8.38
6	18.80	9.13	22.96	9.67
8	28.63	9.83	32.67	9.71
10	38.52	9.89	42.29	9.62
12	48.15	9.63	21.65	9.36
14	57.57	9.42	61.27	9.62
16	67.10	9.53	70.89	9.62
18	76.81	9.71	80.69	9.80
20	86.59	9.78	90.40	9.71
22	96.35	9.76	100.15	9.75
24	106.12	9.77	109.84	9.69
26	115.86	9.74	119.70	9.86
28	125.76	9.90	129.40	9.70
30	135.54	9.78	139.15	9.75
32	145.35	9.81	149.11	9.96*
34	155.32	9.97*	159.10	9.99
36	165.25	9.93	.....	.....
		2)19.90		19.95
		2)9.95		9.975
		4.9750		4.9875
		4.9875		
		2)9.9625		
		4.9812	Velocity with a Motive Weight of 48 lbs.†	

† The bodies rolled with this Motive Weight.

FRIDAY, September 15, 1797. THURSDAY, September 7, 1797.

Conductor, with round iron bar, cube R, &c.

Thermometer in the Air, 65°;—In the Dock, 61°.—Water in the Dock, 13 feet.—Wind, W. N. W. Moderate.

System Four-fold.

Total Weight 294 lbs.			Motive Wt. 72 lbs.	
Accel. Wt. Chain 7 ft.			A. Wt. Chain 7 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.70	6.70	7.04	7.04
4	17.97	11.27	17.75	10.71
6	29.40	11.43	29.52	11.77
8	41.25	11.85	41.90	12.38
10	53.20	11.95	53.49	11.59
12	64.49	11.29	65.44	11.95
14	76.65	12.16	77.45	12.01
16	88.74	12.09	89.56	12.11
18	100.91	12.17	101.80	12.24
20	113.18	12.27	113.82	12.02
22	125.49	12.31	126.15	12.33
24	137.75	12.26	138.40	12.25
26	150.00	12.25*	150.80	12.40*
28	162.19	12.19	163.19	12.39
		2)24.44		24.79
		2)12.22		12.395
		6.1100		6.1975
		6.1975		
		2)12.3075		
		6.1537 Velocity with a Motive Wt. of 72 lbs. †		

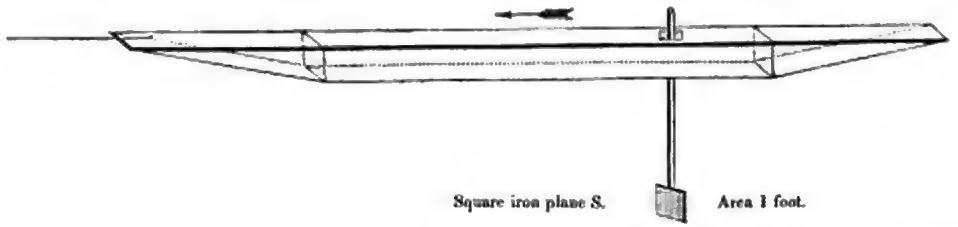
System Four-fold.

Total Wt. 489 lbs. 12 oz.			M. Wt. 120 lbs.	
Accel. Wt. Chain 13 ft. 6 in.			A. Wt. Chain 13 ft. 6 in.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	11.80	11.80	5.95	5.95
4	27.95	16.15	19.91	13.96
6	44.31	16.36	36.11	16.20
8	60.32	16.01	52.41	16.30
10	76.34	16.02	68.28	15.87
12	92.57	16.23	84.00	15.72
14	108.30	15.73	99.79	15.79
16	124.32	16.02	115.89	16.10
18	140.40	16.08*	131.81	15.92
20	156.65	16.25	147.92	16.11*
22	.....	.....	163.94	16.02
		2)32.33		32.13
		2)16.165		16.065
		8.0825		8.0325
		8.0325		
		2)16.1150		
		8.0575 Velocity with a Motive Wt. of 120 lbs.		

† The bodies rolled with this Motive Weight.

N. B. The bodies rolled so much when drawn with a Motive Weight of 96lbs. that the experiments are rejected.

Conductor, with round iron bar and square plane S, immersed six feet.



	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment	.....	2.3413	3.3641	.....	4.8977	.....	6.0872*	7.1409	8.0366
Correction for Line	.....	2.3532	3.3813	.....	4.9276	.....	6.1378	7.2002	8.1034
Hutt. Correction, or Regular Series	1.6116	2.3430	3.4064	4.2400	4.9525	5.5866	6.1644	7.2002	8.1221

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	2.4796	8.9504	18.968	32.316	48.856	68.483	91.116	116.68	145.13	176.40	210.44	247.26	308.68
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.41	54.54	65.54	77.39	90.06	110.97
Resistance and Friction	1.2949	4.9863	10.931	19.048	29.279	41.585	55.927	72.27	90.59	110.86	133.05	157.20	197.71

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.										
12 and	24	1.9122									
	48	1.8757	24..48	1.8406							
	72	1.8690	72	1.8427	48..72	1.8463					
	96	1.8594	96	1.8341	96	1.8277	72..96	1.8021			
	120	1.8622	120	1.8415	120	1.8421	120	1.8388	96..120	1.8883	

15)27.7827

Mean 12 lbs. and 96 lbs. 1.8522

* Query 6.0881 ?

Digitized by Google

SATURDAY, September 16, 1797.

Conductor, with round iron bar and square plane S, immersed six feet.

Thermometer in the Air, 65°;—In the Dock, 61°.—Water in the Dock, 12 ft. 9 in.—Wind, S. W. Moderate.

System Four-fold.

Total Weight 49 lbs. 11 oz. 8 dwts. Motive Weight 12 lbs.

Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.39	4.39	3.85	3.85	4.76	4.76	3.15	3.15	4.30	4.30
8	11.49	7.10	10.38	6.55	11.90	7.14	9.54	6.39	11.26	6.96
12	19.56	8.07	18.32	7.94	20.10	8.20	17.45	7.91	19.70	8.44
16	28.15	8.59	26.85	8.53	28.73	8.63	26.20	8.75	28.50	8.80
20	37.11	8.96	35.74	8.89	37.74	9.01	34.95	8.45	37.75	9.25
24	46.19	9.08	44.87	9.13	47.00	9.26	43.97	9.02	47.00	9.25
28	55.21	9.02	54.06	9.19	56.31	9.31	53.30	9.33	56.50	9.50
32	64.12	8.91	63.25	9.19	65.60	9.29	62.67	9.37	65.75	9.25
36	73.05	8.93	72.50	9.25	74.80	9.20	71.97	9.30	74.72	8.97
40	82.04	8.99	81.67	9.17	84.04	9.24	81.32	9.35	83.53	8.81
44	91.22	9.18	90.75	9.08	93.40	9.36	90.75	9.43	92.51	8.98
48	100.39	9.17	99.87	9.12	102.83	9.43	100.29	9.54	101.39	8.88
52	109.45	9.06	108.89	9.02	112.15	9.32	109.59	9.30	110.78	9.39
56	118.43	8.98	117.90	9.01	121.42	9.27	118.73	9.14	119.80	9.02
60	127.36	8.93	127.09	9.19	130.55	9.13	127.80	9.07	128.89	9.09
64	136.32	8.96	136.35	9.26	139.76	9.21	136.85	9.05	137.98	9.09
68	145.50	9.18	141.00	4.65	144.40	4.64	146.10	9.25	142.75	4.77
70	150.09	4.59	145.63	4.63	148.94	4.54	150.83	4.73	147.40	4.65
72	154.63	4.54	150.32	4.69	153.43	4.49	155.45	4.62	152.23	4.83
74	159.24	4.61	154.94	4.62	158.00	4.57	160.05	4.60*	156.99	4.76
76	163.87	4.63*	159.55	4.61	162.64	4.64*	164.85	4.80	161.73	4.74*
78	168.60	4.73	164.25	4.70*	167.28	4.64	169.65	4.80	166.48	4.75
80	173.22	4.62	168.85	4.60	.....	.....	.....	.....	171.18	4.70
		3)13.98		2)9.30		9.28		3)14.20		14.19
		2)4.66		4.65		4.64		4.7333		4.73
		2.3300		2.325		2.32		2.3666		2.365
		2.3250								
		2.3200								
		2.3666								
		2.3650								
		5)11.7066								
		2.3413	Velocity with a Motive Weight of 12 lbs.							

SATURDAY, September 16, 1797.

Conductor, with round iron bar and square plane S, immersed six feet.

System Four-fold.

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.								
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.13	5.13	7.34	7.34	5.98	5.98	4.89	4.89
8	15.76	10.63	18.10	10.76	16.90	10.92	15.55	10.66
12	28.45	12.69	31.29	13.19	29.39	12.49	27.92	12.37
16	41.38	12.93	44.39	13.10	42.41	13.02	40.96	13.04
20	54.23	12.85	57.38	12.99	55.35	12.94	54.26	13.30
24	67.01	12.78	70.45	13.07	68.76	13.41	67.72	13.46
28	79.93	12.92	83.69	13.24	81.94	13.18	80.75	13.03
32	93.34	13.41	96.95	13.26	95.25	13.31	94.19	13.44
34	100.10	6.76	110.17	13.22	108.60	13.35	107.40	13.21
36	106.77	6.67	123.35	13.18	122.00	13.40	120.94	13.54
38	113.41	6.64	130.08	6.73	135.30	13.30	134.27	13.33
40	120.00	6.59	136.67	6.59	142.17	6.87	140.85	6.58
42	126.64	6.64	143.45	6.78	148.85	6.68	147.63	6.78*
44	133.27	6.63	150.16	6.71*	155.64	6.79*	154.38	6.75
46	139.95	6.68	156.98	6.82	162.35	6.71	161.05	6.67
48	146.60	6.65	163.72	6.74	.....	.....	.....	.....
50	153.25	6.65*	.....	.....	.....	.....	.....	.....
52	160.00	6.75	.....	.....	.....	.....	.....	.....
54	166.67	6.67	.....	.....	.....	.....	.....	.....
		3)20.07		20.27		2)13.50		3)20.20
		2)6.69		6.7566		6.75		6.7333
		3.345		3.3783		3.375		3.3666

SATURDAY, September 16, 1797.

Conductor, with round iron bar and square plane S, &c.

System Four-fold

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.64	4.64	5.95	5.95	7.15	7.15
8	15.30	10.66	16.87	10.92	18.74	11.59
12	27.67	12.37	29.50	12.63	31.68	12.94
16	40.50	12.83	42.59	13.09	44.75	13.07
20	53.62	13.12	55.69	13.10	57.76	13.01
24	66.95	13.33	68.87	13.18	71.15	13.39
28	80.15	13.20	82.25	13.38	85.04	13.89
32	93.30	13.15	95.64	13.39	98.73	13.69
36	106.50	13.20	108.79	13.15	112.15	13.42
40	120.04	13.54	121.99	13.20	125.51	13.36
44	133.49	13.45	135.19	13.20	138.79	13.28
46	140.35	6.86	141.80	6.61	145.46	6.67
48	147.00	6.65	148.38	6.58	152.30	6.84*
50	153.70	6.70*	155.16	6.78*	159.16	6.86
52	160.35	6.65	161.64	6.48	166.03	6.87
54	167.02	6.67	168.32	6.68	172.85	6.82
		3)20.02		19.94		4)27.39
		2)6.6733		6.6466		6.8475
		3.3366		3.3233		3.4237
		3.3233				
		3.4237				
		3.3666				
		3.3750				
		3.3783				
		3.3450				
		7)23.5485				
		3.3641 Velocity with a Motive Weight of 24 lbs.				

SATURDAY, September 16, 1797.

Conductor, with round iron bar and square plane S, &c.

System Four-fold.

Total Weight 197 lbs. Motive Weight 48 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.16	7.16	8.15	8.15	8.19	8.19
8	22.77	15.61	24.70	16.55	25.07	16.88
12	40.43	17.66	43.29	18.59	43.80	18.73
16	59.09	18.66	61.69	18.40	62.76	18.96
20	78.31	19.22	80.80	19.11	82.03	19.27
24	97.35	19.04	100.00	19.20	91.72	9.69
26	106.99	9.64	109.65	9.65	101.49	9.77
28	116.58	9.59	119.35	9.70	111.30	9.81
30	126.10	9.52	128.97	9.62	121.12	9.82
32	135.67	9.57	138.85	9.88	130.97	9.85
34	145.58	9.91*	148.55	9.70*	140.70	9.73
36	155.43	9.85	158.35	9.80	150.43	9.73*
38	165.19	9.76	168.11	9.76	160.20	9.77
40	.....	.....	.....	.....	170.08	9.88
		3)29.52		29.26		29.38
		2)9.84		9.7533		9.7933
		4.9200		4.8766		4.8966
		4.8766				
		4.8966				
		3)14.6932				
		4.8977 Velocity with a Motive Weight of 48 lbs.				

FRIDAY, September 15, 1797.

Conductor, with round iron bar and square plane S, &c.

Thermometer in the Air, 65°;—In the Dock, 61°.—Water in the Dock, 13 feet.—Wind, W.N.W. Moderate.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 7 in. 9			A. Wt. Chain ft. 7 in. 9		A. Wt. Chain ft. 7 in. 9		A. Wt. Chain ft. 7 in. 9	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.90	3.90	1.85	1.85	5.76	5.76	5.39	5.39
4	9.98	6.08	9.49	7.64	15.14	9.38	14.64	9.25
6	18.93	8.95	19.75	10.26	26.21	11.07	25.35	10.71
8	30.14	11.21	30.89	11.14	37.63	11.42	36.98	11.63
10	41.76	11.62	42.39	11.50	49.15	11.52	48.77	11.79
12	53.40	11.64	54.05	11.66	60.95	11.80	60.72	11.95
14	65.15	11.75	65.97	11.92	72.85	11.90	72.79	12.07
16	76.99	11.84	78.06	12.09	84.73	11.88	84.89	12.10
18	88.77	11.78	90.07	12.01	96.69	11.96	96.69†	11.79
20	100.64	11.87	101.92	11.85	108.70	12.01	108.64	11.96
22	112.77	12.13	112.95‡	12.03	121.04	12.34	120.72	12.08
24	124.93	12.16*	125.92	11.97*	133.10	12.06*	132.95	12.23*
26	136.90	11.97	138.02	12.10	145.35	12.25	145.20	12.25
28	149.09	12.19	149.98	11.96	157.70	12.35	157.43	12.23
30	161.23	12.14	162.34	12.36	170.04	12.34	169.69§	12.23
		4)48.46		48.39		49.00		48.94
		2)12.115		12.0975		12.25		12.235
		6.0575		6.0487		6.125		6.1175
		6.0487						
		6.1250						
		6.1175						
		4)24.3487						
		6.0872 Velocity with a Motive Weight of 72 lbs.						

† Should be 96.68? ‡ Should be 113.95? § Should be 169.66?

FRIDAY, September 15, 1797.

Conductor, with round iron bar and square plane S, &c.

System Four-fold.

Total Weight 395 lbs. Motive Weight 96 lbs.

Accel. Wt. Chain ft. 7 in. 9			A. Wt. Chain ft. 7 in. 9		A. Wt. Chain ft. 7 in. 9		A. Wt. Chain ft. 7 in. 9		A. Wt. Chain ft. 7 in. 9	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.65	8.65	8.70	8.70	3.65	3.65	6.95	6.95	1.30	1.30
4	20.64	11.99	20.90	10.20	13.75	10.10	18.15	11.20	9.49	8.19
6	33.98	13.34	34.38	13.48	26.54	12.79	31.21	13.06	21.43	11.94
8	47.62	13.64	47.93	13.55	40.23	13.69	44.79	13.58	34.65	13.22
10	61.50	13.88	61.98	14.05	54.15	13.92	58.65	13.86	48.85	14.20
12	75.70	14.20	75.99	14.01	67.91	13.76	72.63	13.98	62.50	13.65
14	89.90	14.20	90.19	14.20	81.85	13.94	86.90	14.27	76.83	14.33
16	104.26	14.36	104.15	13.96	96.15	14.30	101.24	14.34	91.10	14.27
18	118.78	14.52	118.51	14.36	110.30	14.15	115.20	13.96	105.27	14.17
20	133.18	14.40*	132.86	14.35*	124.20	13.90	129.51	14.31*	119.53	14.26
22	147.43	14.25	147.19	14.33	138.22	14.02*	143.70	14.19	134.09	14.56*
24	161.67	14.24	161.42	14.23	152.34	14.12	157.90	14.20	148.40	14.31
26	.....	.....	.....	.....	166.53	14.19	.....	.....	162.93	14.53
	3)42.89		42.91		42.33		42.70		43.40	
	2)14.2966		14.3033		14.11		14.2333		14.4666	
	7.1483		7.1516		7.055		7.1166		7.2333	
	7.1516									
	7.0550									
	7.1166									
	7.2333									
	5)35.7048									
	7.14096 Velocity with a Motive Weight of 96 lbs.									

FRIDAY, September 15, 1797.

Conductor, with round iron bar and square plane S, &c.

System Four-fold.

Total Weight 489 lbs. 12 oz. Motive Weight 120 lbs.						
Accel. Wt. Chain ft. 7 in. 3			A. Wt. Chain ft. 7 in. 3		A. Wt. Chain ft. 9	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	9.55	9.55	10.09	10.09	8.72	8.72
4	22.85	13.30	23.99	13.90	21.80	13.08
6	37.83	14.98	39.38	15.39	36.85	15.05
8	53.20	15.37	55.09	15.71	52.10	15.25
10	69.05	15.85	70.80	15.71	68.09	15.99
12	84.98	15.93	86.70	15.90	83.97	15.88
14	100.90	15.92	102.49	15.79	99.98	16.01
16	116.93	16.03	118.45	15.96	115.65	15.67
18	132.95	16.02*	134.60	16.15*	131.73	16.08
20	148.95	16.00	150.65	16.05	147.95	16.22*
22	.....	.....	.....	.....	163.95	16.00
		2)32.02		32.20		32.22
		2)16.01		16.10		16.11
		8.005		8.05		8.055
		8.050				
		8.055				
		3)24.110				
		8.0366 Velocity with a Motive Weight of 120 lbs.				

Conductor, with round iron bar and round plane T, immersed six feet.

	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	2.4141	3.4350	4.2716	4.9341	.....	6.1616	7.2550	8.0925
Correction for Line	.....	2.4264	3.4525	4.2977	4.9642	.....	6.2128	7.3153	8.1598
Hutt. Correction, or Regular Series	1.6799	2.4267	3.5055	4.3470	5.4640	5.7005	6.2796	7.3153	8.2349

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	2.2579	8.3348	17.896	30.776	46.864	66.077	88.352	113.63	141.87	173.03	207.07	243.97	305.75
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.41	54.54	65.54	77.39	90.06	110.97
Resistance and Friction.....	1.0738	4.3707	9.859	17.508	27.287	39.179	53.163	69.22	87.33	107.49	129.68	153.91	194.78
Resistance and Friction of S.	1.2949	4.9863	10.931	19.048	29.279	41.585	55.927	72.27	90.59	110.86	133.05	157.20	197.71
Mean Resistance.....	1.1843	4.6785	10.395	18.278	28.283	40.382	54.545	70.75	88.96	109.17	131.36	155.45	196.24
Powers of the Resistance....	1.9820	1.9690	1.9618	1.9565	1.9533	1.9503	1.9475	1.9452	1.9431	1.9414	1.9352	1.9400	1.9*

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
12 and	24	1.9654											
	36	1.9218	24..36	1.8516									
	48	1.9066	48	1.9088	36..48	1.9054							
	72	1.9057	72	1.8700	72	1.8809	48..72	1.8072					
	96	1.8843	96	1.8463	96	1.8441	96	1.7878	72..96	1.7611			
	120	1.8985	120	1.8712	120	1.8779	120	1.8438	120	1.8739	96..120	2.0425	

21)39.5748

Mean 12 lbs. and 96 lbs. . 1.8845

* Mean of the whole.

SATURDAY, September 9, 1797.

Conductor, with round iron bar and round plane T, immersed six feet.

Thermometer in the Air, 62°;—In the Dock, 62½°.—Water in the Dock, 12 ft. 9 in.—Wind, W.N.W. Fresh Breeze.

System Four-fold.

T. Wt. 49 lbs. 11 oz. 8 drs.			M. Wt. 12 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.10	4.10	4.38	4.38
8	10.95	6.85	11.28	6.90
12	18.89	7.94	19.34	8.06
16	27.45	8.56	27.88	8.14
20	36.48	9.03	36.75	8.87
24	45.60	9.12	45.95	9.20
28	54.75	9.15	55.07	9.12
32	64.00	9.25	64.21	9.14
36	73.39	9.39	73.45	9.24
40	82.60	9.21	82.82	9.35
44	91.84	9.24	92.21	9.41
48	101.17	9.33	101.41	9.23
52	110.49	9.32	110.84	9.40
56	119.85	9.36	120.35	9.51
60	129.39	9.54	129.87	9.52
62	138.98	9.59	139.35	9.48
64	143.78	4.80	144.15	4.80
66	148.54	4.76	148.97	4.82
68	153.40	4.86	153.75	4.78
70	158.11	4.71*	158.60	4.85
72	162.91	4.80	163.40	4.80*
74	167.87	4.96	168.30	4.90
76	.....	.....	173.10	4.80
		3)14.47		14.50
		2)4.8233		4.8333
		2.4116		2.4166
		2.4166		
		2)4.8282		
		2.4141	Velocity with a Motive Weight of 12 lbs.	

SATURDAY, September 9, 1797.

Conductor, with round iron bar and round plane T, &c.

System Four-fold.

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.27	6.27	5.65	5.65	6.25	6.25
8	17.25	10.98	16.21	10.56	17.14	10.89
12	29.95	12.70	28.51	12.30	29.67	12.53
16	43.30	13.45	41.24	12.73	42.83	13.16
20	56.85	13.55	54.29	13.05	56.15	13.32
24	70.29	13.44	67.52	13.23	69.32	13.17
28	83.96	13.67	81.11	13.59	82.81	13.49
32	97.40	13.44	94.68	13.57	96.35	13.54
36	110.78	13.38	108.19	13.51	109.74	13.39
40	124.40	13.62	121.80	13.61	123.34	13.60
42	131.20	6.80	128.78	6.98	130.15	6.81
44	137.89	6.69	135.69	6.91	137.09	6.94
46	144.75	6.86	142.58	6.89	144.05	6.96
48	151.65	6.90*	149.50	6.92*	150.90	6.85*
50	158.39	6.74	156.47	6.97	157.78	6.88
52	165.14	6.75	163.46	6.99	164.61	6.83
		3)20.39		20.88		20.56
		2)6.7966		6.96		6.8533
		3.3983		3.48		3.4266
		3.4800				
		3.4266				
		3)10.3050				
		3.4350 Velocity with a Motive Weight of 24 lbs.				

SATURDAY, September 9, 1797.

Conductor, with round iron bar and round plane T, &c.

System Four-fold.

Total Weight 148 lbs.			Motive Weight 36 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	8.59	8.59	7.98	7.98
8	22.53	13.94	21.89	13.91
12	37.82	15.29	37.44	15.55
16	53.84	16.02	53.76	16.32
20	70.25	16.41	70.34	16.58
24	86.97	16.72	86.95	16.61
28	103.80	16.83	103.68	16.73
30	112.30	8.50	112.14	8.46
32	120.85	8.55	120.24	8.40
34	129.40	8.55	128.91	8.37
36	138.05	8.65	137.18	8.27
38	146.70	8.65*	145.71	8.53*
40	155.18	8.48	154.23	8.52
42	163.72	8.54	162.77	8.54
		3)25.67		25.59
		2)8.5566		8.5366
		4.2783		4.2650
		4.2650		
		2)8.5433		
		4.2716 Velocity with a Motive Weight of 36 lbs.		

SATURDAY, September 9, 1797.

Conductor, with round iron bar and round plane T, &c.

System Four-fold.

Total Weight 197 lbs. Motive Weight 48 lbs.								
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.27	4.27	4.53	4.53	1.35	1.35	2.14	2.14
4	11.32	7.05	11.73	7.20	6.69	5.34	8.15	6.01
6	19.45	8.13	19.96	8.23	14.08	7.39	15.90	7.75
8	28.19	8.64	28.73	8.77	22.39	8.31	24.50	8.60
10	37.53	9.34	38.14	9.41	31.28	8.89	33.53	9.03
12	47.18	9.65	47.49	9.35	40.60	9.32	42.85	9.32
14	57.00	9.82	57.18	9.69	49.93	9.33	52.35	9.50
16	66.84	9.84	66.91	9.73	59.43	9.50	61.98	9.63
18	76.60	9.76	76.67	9.76	68.98	9.55	71.53	9.55
20	86.32	9.72	86.39	9.72	78.52	9.54	81.27	9.74
22	95.89	9.57	96.53	10.14	88.29	9.77	90.82	9.55
24	105.78	9.89	106.44	9.91	98.05	9.76	100.55	9.73
26	115.60	9.82	116.45	10.01	107.75	9.70	110.31	9.76
28	125.50	9.90	126.39	9.94	117.68	9.93	120.29	9.98
30	135.39	9.89*	136.25	9.86*	127.53	9.85	130.11	9.82
32	145.30	9.91	146.09	9.84	137.35	9.82*	139.96	9.85*
34	155.05	9.75	156.10	10.01	147.14	9.79	149.79	9.83
36	164.94	9.89	166.27	10.17	156.91	9.77	159.67	9.88
38	.....	.....	.....	.....	166.69	9.78	.....	.....
		4)39.44		39.88		39.16		3)29.56
		2)9.86		9.97		9.79		9.8533
		4.9300		4.985		4.895		4.9266
		4.9850						
		4.8950						
		4.9266						
		4)19.7366						
		4.9341 Velocity with a Motive Weight of 48 lbs.						

FRIDAY, September 8, 1797.

Conductor, with round iron bar and round plane T, &c.

Thermometer in the Air, 64½°;—In the Dock, 63°.—Water in the Dock, 12 ft. 9 in.—Wind, West. Light Airs.

System Four-fold.

Total Weight 294 lbs. Motive Wt. 72 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.95	2.95	2.42	2.42	5.62	5.62
4	10.85	7.90	9.90	7.48	14.82	9.20
6	20.78	9.93	19.92	10.02	25.32	10.50
8	31.56	10.78	30.73	10.81	36.68	11.36
10	43.14	11.58	42.38	11.65	48.32	11.64
12	55.30	12.16	54.38	12.00	60.25	11.93
14	67.10	11.80	66.50	12.12	72.36	12.11
16	78.95	11.85	78.59	12.09	84.32	11.96
18	91.04	12.19	90.72	12.13	96.50	12.18
20	103.20	12.16	102.97	12.25	108.82	12.32
22	115.50	12.30	115.25	12.28	121.11	12.29
24	127.73	12.23	127.48	12.23	133.31	12.20*
26	140.00	12.27*	139.68	12.20*	145.62	12.31
28	152.40	12.40	152.09	12.41	158.08	12.46
30	164.76	12.36	164.39	12.30	.....	.....
		3)37.03		36.91		36.97
		2)12.3433		12.3033		12.3233
		6.1716		6.1516		6.1616
		6.1516				
		6.1616				
		3)18.4848				
		6.1616 Velocity with a Motive Wt. of 72 lbs.				

FRIDAY, September 8, 1797.

Conductor, with round iron bar and round plane T, &c.

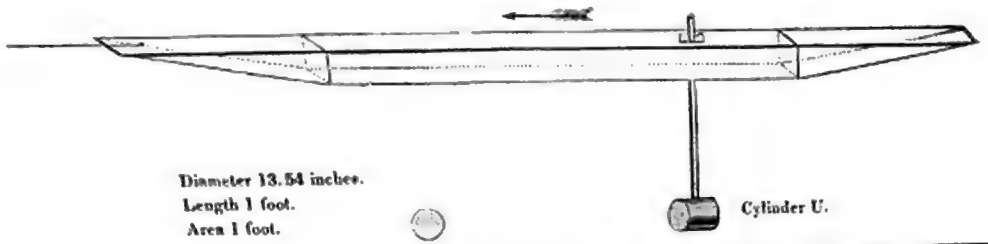
System Four-fold.

Total Wt. 395 lbs. Motive Wt. 96 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.70	6.70	3.00	3.00
4	17.70	11.00	12.61	9.61
6	30.56	12.86	24.88	12.27
8	44.31	11.75	38.15	13.27
10	58.60	14.29	51.97	13.82
12	72.73	14.13	66.20	14.23
14	87.04	14.31	80.47	14.27
16	101.51	14.47	94.82	14.35
18	116.05	14.54	109.12	14.30
20	130.50	14.45*	123.70	14.58
22	144.92	14.42	138.30	14.60*
24	169.61	14.69	152.65	14.35
26	.....	.....	167.20	14.55
		3)43.56		43.50
		2)14.52		14.50
		7.26		7.25
		7.25		
		2)14.51		
		7.255	Velocity with a Motive Wt. of 96 lbs.	

System Four-fold.

Total Wt. 489 lbs. Motive Wt. 120 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.35	4.35	3.25	3.25
4	15.63	11.28	14.41	11.16
6	29.89	14.26	28.87	14.46
8	44.97	15.08	44.26	15.29
10	60.70	15.73	59.91	15.65
12	76.73	16.03	76.15	16.24
14	92.60	15.87	92.52	16.37
16	108.83	16.23	108.74	16.22*
18	125.18	16.35	124.84	16.10
20	141.36	16.18*	.....	.....
22	157.60	16.24	.....	.....
		2)32.42		32.32
		2)16.21		16.16
		8.105		8.08
		8.080		
		2)16.185		
		8.0925	Velocity with a Motive Weight of 120 lbs.	

Conductor, with round iron bar and cylinder U, immersed six feet.



	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	2.4658	3.5931	4.4526	5.0750	.....	6.2793	7.4000	8.285
Correction for Line	.....	2.4784	3.6114	4.4798	5.1069	.....	6.3323	7.4614	8.3524
Hutt. Correction, or Regular Series	1.7520	2.5167	3.6155	4.4689	5.1939	5.8364	6.4198	7.4614	8.3843

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	2.0521	7.7297	16.794	29.120	44.629	63.261	84.964	109.70	137.43	168.12	201.76	238.30	299.68
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.41	54.54	65.54	77.39	90.06	110.97
Resistance and Friction.....	0.8680	3.7656	8.757	15.852	25.052	36.363	49.775	65.29	82.89	102.58	124.37	148.24	188.71
Friction on 3.545 feet.....	0.0132	0.0507	0.111	0.194	0.299	0.425	0.573	0.74	0.93	1.14	1.37	1.62	2.04
Plus and Minus Pressures ..	0.8548	3.7149	8.646	15.658	24.753	35.938	49.202	64.55	81.96	101.44	123.00	146.62	186.67

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs													
12 and	24	1.8412												
	36	1.8559	24..36	1.8817										
	48	1.9181	48	2.0015	36..48	2.1988								
	72	1.9101	72	1.9563	72	2.0029	48..72	1.8837						
	96	1.8868	96	1.9104	96	1.9226	96	1.8273	72..96	1.7534				
	120	1.8952	120	1.9196	120	1.9327	120	1.8619	120	1.8449	96..120	1.9781		

21)40.1831

Mean 72 lbs. and 96 lbs. 1.9134

THURSDAY, September 21, 1797.

Conductor, with round iron bar and cylinder U, immersed six feet.

Thermometer in the Air, 67½°;—In the Dock, 59½°.—Water in the Dock, { 12ft. 6in. / 13ft. 9in. } —Wind, Westerly. Light Airs.

System Four-fold.

Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.24	4.24	4.00	4.00	4.54	4.54
8	11.32	7.08	10.90	6.90	11.65	7.11
12	19.90	8.58	19.46	8.56	20.38	8.73
16	28.99	9.09	28.63	9.17	29.57	9.19
20	38.49	9.50	38.11	9.48	38.80	9.23
24	47.95	9.46	47.63	9.52	48.32	9.52
28	57.55	9.80	57.25	9.62	57.90	9.58
32	67.17	9.62	66.95	9.70	67.40	9.50
36	76.90	9.73	76.30	9.35	76.97	9.57
40	86.40	9.50	85.89	9.59	86.69	9.72
44	96.05	9.65	95.46	9.57	96.45	9.76
48	105.85	9.80	105.09	9.63	106.10	9.75
52	115.75	9.90	114.65	9.56	115.84	9.74
56	125.40	9.65	124.45	9.80	125.69	9.85
58	130.41	5.01	134.15	9.70	130.53	4.84
60	135.40	4.99	138.96	4.81	135.25	4.72
62	140.39	4.99	143.95	4.99	140.15	4.90
64	145.40	5.01	148.85	4.90	145.08	4.93
66	150.40	5.00	153.79	4.94*	150.02	4.94
68	155.40	5.00*	168.66†	4.87	155.01	4.99*
70	160.35	4.95	163.58	4.92	159.89	4.88
72	165.29	4.94	168.54	4.96	164.80	4.91
74	170.16	4.87	.....	.....	169.75	4.95
		4)19.76		19.69		19.73
		2)4.94		4.9225		4.9325
		2.4700		2.4612		2.4662
		2.4612				
		2.4662				
		3)7.3974				
		2.4658 Velocity with a Motive Weight of 12 lbs.				

† Query 158.66?

THURSDAY, September 21, 1797. WEDNESDAY, September 20, 1797.

Conductor, with round iron bar and cylinder U, &c.

Thermometer in the Air, 62½°;—In the Dock, 61°.—Water in the Dock, 10 ft. 9 in.—Wind, S. W. Strong Breeze.

System Four-fold.

Total Wt. 99 lbs. 12 oz.	M. Wt. 24 lbs.			
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.66	4.66	3.29	3.29
8	15.49	10.83	13.35	10.06
12	28.64	13.15	25.95	12.60
16	42.40	13.76	39.50	13.55
20	56.30	13.90	53.45	13.95
24	70.32	14.02	67.40	13.95
28	84.48	14.16	81.23	13.83
32	98.80	14.32	95.24	14.01
36	112.95	14.15	109.60	14.36
38	120.03	7.08	116.61	7.01
40	127.23	7.20	123.84	7.23
42	134.25	7.02	130.98	7.14
44	141.30	7.05	138.08	7.10
46	148.35	7.05*	145.30	7.22*
48	155.60	7.25	152.60	7.30
50	162.70	7.10	159.75	7.15
52	169.91	7.21	166.96	7.21
		4)28.61		28.88
		2)7.1525		7.22
		3.5762		3.61
		3.6100		
		2)7.1862		
		3.5931 Velocity with a Motive Wt. of 24 lbs.		

System Four-fold.

Total Weight 148 lbs.	Motive Weight 36 lbs.			
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.55	7.55	7.11	7.11
8	22.00	14.45	21.55	14.44
12	38.60	16.60	38.05	16.50
16	55.45	16.85	55.69	17.64
20	72.53	17.08	73.52	17.83
24	89.65	17.12	91.60	18.08
28	107.15	17.50	100.59	8.99
30	115.78	8.63	109.23	8.64
32	124.55	8.77	117.95	8.72
34	133.38	8.83	126.71	8.76
36	142.29	8.91	135.72	9.01
38	151.15	8.86*	144.60	8.88
40	159.99	8.84	153.35	8.75*
42	168.88	8.89	162.11	8.76
44	.....	.....	170.95	8.84
		3)26.59		26.35
		2)8.8633		8.7833
		4.4316		4.3916
		4.3916		
		2)8.8232		
		4.4116 Velocity with a Motive Weight of 36 lbs.		

THURSDAY, September 21, 1797.

Conductor, with round iron bar and cylinder U, &c.

Thermometer in the Air, 67½°;—In the Dock, 59½°.—Water in the Dock, { 12ft.6in. / 13ft.9in. }—Wind, Westerly. Light Airs.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	10.45	10.45	8.28	8.28	7.78	7.78
8	25.86	15.41	23.25	14.97	22.41	14.63
12	42.34	16.48	39.44	16.19	38.65	16.24
16	58.89	16.55	56.35	16.91	55.15	16.50
20	75.85†	16.94	73.45	17.10	72.09	16.94
24	92.89	17.06	91.03	17.58	88.97	16.88
26	101.54	8.65	99.83	8.83‡	105.95	16.98
28	110.16	8.62	108.64	8.81	114.50	8.55
30	118.89	8.73	117.50	8.86	122.96	8.46
32	128.83	8.94	126.26	8.76	131.69	8.63
34	136.89	9.06	134.85	8.59*	140.23	8.64
36	145.92	9.03*	143.80	8.95	149.02	8.79*
38	155.15	9.23	152.84	9.04	157.68	8.66
40	164.11	8.96	.....	.....	166.45	8.77
		3)27.22		26.58		26.22
		2)9.0733		8.86		8,74
		4.5366		4.43		4.37
		4.4300				
		4.3700				
		3)13.3366				
		4.4455 Velocity with a Motive Weight of 36 lbs.; for the result see the next page.				

† Query 75.83?

‡ Query 8.80?

THURSDAY, September 28, 1797. THURSDAY, September 21, 1797.

Conductor, with round iron bar and cylinder U, &c.

Thermometer in the Air, 59½;—In the Dock, 59°.
—Water in the Dock, 13 feet.—Calm.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	8.95	8.95	10.87	10.87
8	23.80	14.95	26.25	15.38
12	40.30	16.50	42.50	16.25
16	56.90	16.60	59.28	16.78
20	73.79	16.89	76.30	17.02
24	90.89	17.10	93.72	17.42
28	108.70	17.81	111.35	17.63
30	117.60	8.90	120.27	8.92
32	126.79	9.19	129.23	8.96
34	135.79	9.00	138.20	8.97
36	144.95	9.16*	146.96	8.75*
38	154.10	9.15	155.91	8.96
40	163.29	9.19	164.75	8.84
		3)27.50		26.55
		2)9.1666		8.85
		4.5833		4.425
		4.4250		
		4.5366		
		4.4300		
		4.3700		
		4.4316		
		4.3916		
		7)31.1681		
		4.4526 Velocity with a Motive Weight of 36 lbs.		

System Four-fold.

Total Weight 197 lbs. Motive Weight 48 lbs.

Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.67	2.67	4.95	4.95
4	8.30	5.63	12.05	7.10
6	16.43	8.13	20.75	8.70
8	25.60	9.17	30.26	9.51
10	35.30	9.70	39.95	9.69
12	45.00	9.70	49.54	9.59
14	54.71	9.71	59.05	9.51
16	64.75	10.04	68.89	9.84
18	74.80	10.05	78.86	9.97
20	84.70	9.90	88.71	9.85
22	94.89	10.19	98.60	9.89
24	104.85	9.96	108.53	9.93
26	114.90	10.05	118.61	10.08
28	125.05	10.15	128.67	10.06
30	135.20	10.15*	138.71	10.04*
32	145.29	10.09	148.91	10.20
34	155.40	10.11	159.23	10.32
36	165.65	10.25	169.27	10.04
		4)40.60		40.60
		2)10.15		10.15
		5.075		5.075
		5.075		
		2)10.150		
		5.075 Velocity with a Motive Weight of 48 lbs.		

WEDNESDAY, September 20, 1797.

Conductor, with round iron bar, and cylinder U, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Sec.	Accelerating Wt. none. Feet.	Differences.	Accel. Wt. none. Feet.	Differences.	Accel. Wt. none. Feet.	Differences.	Accel. Wt. none. Feet.	Differences.	A. Wt. Chain ft. 5 in. 6 Feet.	Differences.
2	4.44	4.44	1.32	1.32	3.90	3.90	1.40	1.40	3.30	3.30
4	13.20	8.76	7.90	6.58	12.98	9.08	8.19	6.79	11.94	8.64
6	24.37	11.17	17.96	10.06	23.28	10.30	18.34	10.15	22.97	11.03
8	36.37	12.00	29.48	11.52	35.06	11.78	29.62	11.28	34.82	11.85
10	48.95†	12.28	41.04	11.56	47.08	12.02	41.42	11.80	46.80	11.98
12	61.03	12.38	53.46	12.42	59.24	12.16	53.50	12.08	58.70	11.90
14	73.44	12.41	65.73	12.27	71.50	12.26	65.45	11.95	70.80	12.10
16	85.96	12.52	77.89	12.16	84.03	12.53	77.42	11.97	82.97	12.17
18	98.60	12.64	90.20	12.31	96.58	12.55	89.67	12.25	95.32	12.35
20	111.02	12.42	103.22	13.02	108.80	12.22	102.12	12.45	107.61	12.29
22	123.69	12.67	115.57	12.35	121.22	12.42	114.59	12.46	119.96	12.35
24	136.30	12.61*	128.15	12.58*	133.60	12.38*	126.78	12.19	132.45	12.49
26	148.87	12.57	140.68	12.53	146.15	12.55	139.37	12.59*	144.96	12.51*
28	161.40	12.53	153.24	12.56	158.90	12.75	151.78	12.41	157.41	12.45
30	.....	.....	165.89	12.65	.....	.....	164.50	12.72	169.98	12.57
		3)37.71		4)50.32		3)37.68		37.72		37.53
		2)12.57		12.58		12.56		12.5733		12.51
		6.2850		6.29		6.28		6.2866		6.255
		6.2900								
		6.2800								
		6.2866								
		6.2550								
		5)31.3966								
		6.2793 Velocity with a Motive Weight of 72 lbs.								

† Query 48.65 ?

N. B. The last three sets of experiments were made on the 21st of September.

THURSDAY, September 21, 1797.

Conductor, with round iron bar and cylinder U, &c.

System Four-fold.

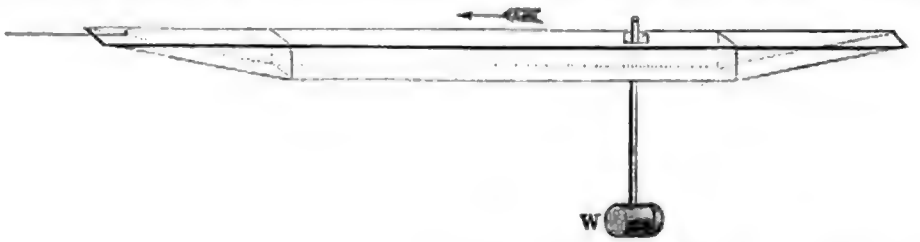
Total Wt. 395 lbs.	Motive Wt. 96 lbs.			
Accel. Wt. Chain ft. 6 in. 6			A. Wt. Chain ft. 6 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.24	1.24	9.90	9.90
4	7.11	5.87	22.31	12.41
6	19.24	12.13	36.67	14.36
8	32.95	13.71	50.97	14.30
10	46.78	13.83	65.19	14.21†
12	61.19	14.41	79.50	14.31
14	75.60	14.41	94.19	14.69
16	90.03	14.43	108.56	14.37
18	104.83	14.80	123.45	14.89
20	119.45	14.62	138.23	14.78*
22	134.28	14.83*	153.09	14.86
24	148.94	14.66	.....	.....
26	163.79	14.85	.....	.....
		3)44.34		2)29.64
		2)14.78		14.82
		7.39		7.41
		7.41		
		2)14.80		
		7.40 Velocity with a Motive Weight of 96 lbs.		

† Query 14.22?

System Four-fold.

Total Wt. 489 lbs. 12 oz.	M. Wt. 120 lbs.		
Accelerating W. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.35	6.35	9.40	9.40
4	19.56	13.21	23.39	13.99
6	34.60	15.04	39.20	15.81
8	50.49	15.89	55.22	16.02
10	66.78	16.29	71.48	16.26
12	83.15	16.37	87.50	16.02
14	99.64	16.49	103.84	16.34
16	116.22	16.58	120.43	16.59
18	132.55	16.33	137.26	16.83
20	149.00	16.45*	153.79	16.53*
22	165.70	16.70	170.39	16.60
		2)33.15		33.13
		2)16.575		16.565
		8.2875		8.2825
		8.2825		
		2)16.5700		
		8.2850 Velocity with a Motive Wt. of 120 lbs.		

Conductor, round bar and cylinder, with a semi-globe after body, called W, immersed six feet.



	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment	.....	2.6154	3.6416	.....	5.3830	.....	6.6175	.....	.....
Correction for Line	.....	2.6288	3.6602	.....	5.4158	.....	6.6724	.....	.....
Hutt. Correction, or Regular Series	1.8263	2.6238	3.7696	4.6596	5.4158	6.0859	6.6945	7.7810	8.7437

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.8957	7.1042	15.499	26.872	41.179	58.391	78.416	101.24	126.82	155.14	186.16	219.88	276.49
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.41	54.54	65.54	77.39	90.06	110.97
Resistance and Friction.....	0.7116	3.1401	7.462	13.604	21.602	31.493	43.227	56.830	72.28	89.60	108.77	129.82	165.52
Friction on 3.5448 feet.....	0.0132	0.0507	0.111	0.194	0.299	0.425	0.573	0.741	0.93	1.14	1.37	1.62	2.04
Plus and Minus Pressures ..	0.6984	3.0894	7.351	13.410	21.303	31.068	42.654	56.089	71.35	88.46	107.40	128.20	163.48

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.						
12 and	24	2.0942					
	48	1.9179	24..48	1.7691			
	72	1.9236	72	1.8296	48..72	1.9432	

6)11.4776

Mean 12 lbs. and 48 lbs. 1.9129

Digitized by Google

TUESDAY, October 3, 1797.

Conductor, round bar and cylinder, with a semi-globe after body, called W, immersed six feet.

Thermometer in the Air, 68½°;—In the Dock, 60°.—Water in the Dock, 12 feet 6 inches.—Calm.

System Four-fold.

Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.						
Accelerating Wt. none.			Accel. Wt. none.		Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.43	4.43	4.61	4.61	3.80	3.80
8	15.85	11.42	12.05	7.44	10.58	6.78
12	25.04	9.19	21.00	8.95	19.30	9.72
16	34.75	9.71	30.73	9.73	28.90	9.60
20	44.84	10.09	40.60	9.87	38.89	9.99
24	54.93	10.09	50.67	10.07	48.97	10.08
28	64.94	10.01	60.65	9.98	58.98	10.01
32	74.85	9.91	70.69	10.04	68.90	9.92
36	84.94	10.09	80.80	10.11	78.89	9.99
40	95.16	10.22	90.95	10.15	88.99	10.10
44	105.40	10.24	101.15	10.20	99.25	10.26
48	115.69	10.29	111.40	10.25	109.51	10.26
52	125.93	10.24	121.60	10.20	119.95	10.44
54	131.00	5.07	131.90	10.30	130.15	10.20
56	136.15	5.15	137.02	5.12	135.29	5.14
58	141.23	5.08	142.25	5.23	140.40	5.11
60	146.40	5.17	147.44	5.19	145.60	5.20
62	151.55	5.15*	152.60	5.16	150.75	5.15
64	156.75	5.20	157.84	5.24*	165.05†	5.30*
66	161.92	5.17	163.05	5.21	161.30	5.25
68	167.18	5.26	168.25	5.20	166.55	5.25
70	.....	.....	173.49	5.24	171.85	5.30
		4)20.78		20.89		21.10
		2)5.195		5.2225		5.275
		2.5975		2.6112		2.6375
		2.6112				
		2.6375				
		3)7.8462				
		2.6154 Velocity with a Motive Weight of 12 lbs.				

† Query 156.05?

N. B. The first and third set of experiments rolled in a small degree.

TUESDAY, October 3, 1797.

Conductor, round bar and cylinder, with a semi-globe after body, called W, &c.

System Four-fold.

Total Wt. 99 lbs. 12 oz.			M. Wt. 24 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	9.90	9.90	6.00	6.00
8	22.35	12.45	17.43	11.43
12	36.50	14.15	31.00	13.57
16	50.91	14.41	45.20	14.20
20	65.45	14.54	59.40	14.20
24	79.95	14.50	73.55	14.15
28	94.30	14.35	88.00	14.45
32	108.54	14.24	102.60	14.60
34	115.75	7.21	109.80	7.20
36	122.93	7.18	117.15	7.35
38	130.05	7.12	124.50	7.35
40	137.29	7.14	131.89	7.39*
42	144.55	7.26	139.10	7.21
44	151.79	7.24*	146.45	7.35
46	159.00	7.21	.....	.....
48	166.30	7.30	.....	.....
		3)21.75		21.95
		2)7.25		7.3166
		3.6250		3.6583
		3.6583		
		2)7.2833		
		3.6416 Velocity with a Motive Wt. of 24 lbs.		

MONDAY, October 2, 1797.

Thermometer in the Air, 64½°;—In the Dock, 59½°.—Water in the Dock, 12 feet 9 inches.—Calm.

System Four-fold.

Total Wt. 197 lbs.			Motive Wt. 48 lbs.	
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.49	1.49	5.70	5.70
4	6.62	5.13	13.83	8.13
6	14.39	7.77	23.11	9.28
8	23.49	9.10	32.98	9.87
10	33.30	9.81	43.11	10.13
12	43.32	10.02	53.42	10.31
14	53.60	10.28	63.85	10.43
16	63.95	10.35	74.35	10.50
18	74.60	10.65	85.03	10.68
20	85.15	10.55	95.70	10.67
22	95.80	10.65	106.50	10.80
24	106.57	10.77	117.20	10.70
26	117.41	10.84	127.98	10.78
28	128.15	10.74	138.50	10.52*
30	138.95	10.80*	149.34	10.84
32	149.78	10.83	160.03	10.69
34	160.73	10.95	170.76	10.73
36	171.50	10.77	.....	.....
		4)43.35		42.78
		2)10.8375		10.695
		5.4187		5.3475
		5.3475		
		2)10.7662		
		5.3831 Velocity with a Motive Wt. of 48 lbs.		

Digitized by Google

MONDAY, October 2, 1797.

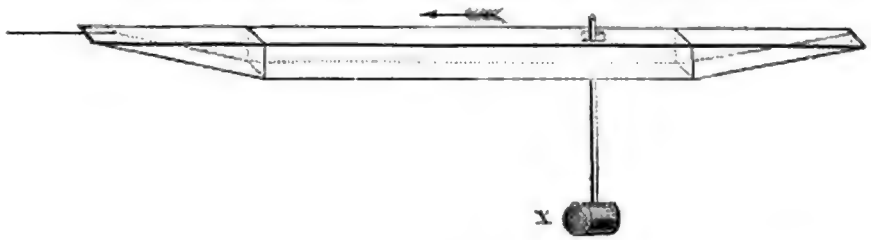
Conductor, round bar and cylinder, with a semi-globe after body, called W, &c.

System Four-fold.

Total Wt. 294 lbs. Motive Weight 72 lbs.				
Accelerating Wt. none.			Accel. Wt. none.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.78	6.78	6.79	6.79
4	16.94	10.16	16.95	10.16
6	28.47	11.53	28.69	11.74
8	40.68	12.21	41.02	12.33
10	53.62	12.94	53.85	12.83
12	66.50	12.88	66.58	12.73
14	79.54	13.04	79.80	13.22
16	92.72	13.18	92.85	13.05
18	105.94	13.22	105.99	13.14
20	118.98	13.04	119.01	13.02
22	132.24	13.26*	132.30	13.29*
24	145.40	13.16	145.50	13.20
26	158.60	13.20	158.80	13.30
		3)39.62		39.79
		2)13.2066		13.2633
		6.6033		6.6316
		6.6316		
		2)13.2350		
		6.6175 Velocity with a Motive Weight of 72 lbs.		

N. B. The last set of experiments was made on the 30th of September; the experiments with this Motive Weight were perfectly steady, the others rolled a little.

Conductor, round bar and cylinder, with a semi-globe fore body, called X, immersed six feet.



	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	3.1694	4.6100	5.6969	6.7925	.....	8.5225	.....	.....
Correction for Line	.....	3.1855	4.6335	5.7316	6.8339	.....	8.5932	.....	.....
Hutt. Correction, or Regular Series	2.1414	3.1539	4.6426	5.8207	6.8339	7.7397	8.5682	10.060	11.393

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.5320	5.3084	10.981	18.374	27.413	38.012	50.112	63.666	78.635	94.982	112.67	131.70	163.25
Conductor and Bar.....	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.408	54.543	65.541	77.39	90.06	110.97
Resistance and Friction	0.3479	1.3443	2.944	5.106	7.836	11.114	14.923	19.258	24.092	29.441	35.28	41.64	52.28
Friction on 3.5448 feet	0.0132	0.0507	0.111	0.194	0.299	0.425	0.573	0.741	0.930	1.140	1.37	1.62	2.04
Plus and Minus Pressures...	0.3347	1.2936	2.833	4.912	7.537	10.689	14.350	18.517	23.162	28.301	33.91	40.02	50.24

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
12 and	24	1.8499							
	36	1.8703	24..36	1.9064					
	48	1.8162	48	1.7837	36..48	1.6355			
	72	1.8055	72	1.7787	72	1.7116	48..72	1.7700	
								10)	17.9278
							Mean 24 lbs. and 48 lbs.		1.79278

FRIDAY, September 29, 1797.

Conductor, round bar and cylinder, with a semi-globe fore body, called X, immersed six feet.

Thermometer in the Air, 65°;—In the Dock, 59½°.—Water in the Dock, 12 ft. 9 in—Wind, Southerly. Light Airs.

System Four-fold.

Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.								
Accel. Wt. Chain 9 ft.			Accel. Wt. Chain 9 ft.		Accel. Wt. Chain 9 ft.		A. Wt. Chain 5 ft. 3 in.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.29	7.29	8.15	8.15	6.05	6.05	6.09	6.09
8	19.53	12.24	20.90	12.75	18.19	12.14	16.20	10.11
12	32.92	13.39	34.40	13.50	31.89	13.70	27.64	11.44
16	46.08	13.16	47.45	13.05	45.03	13.14	39.48	11.84
20	58.82	12.74	60.15	12.70	57.77	12.74	51.30	11.82
24	71.22	12.40	72.57	12.42	70.20	12.43	63.50	12.20
28	82.95	11.73	84.99	12.42	82.60	12.40	75.85	12.35
32	95.98	13.03	97.52	12.53	95.00	12.40	88.19	12.34
36	108.45	12.47	110.05	12.53	107.60	12.60	100.58	12.39
40	120.90	12.45	122.71	12.66	120.05	12.45	112.94	12.36
44	133.52	12.62	135.32	12.61	132.70	12.65	119.19	6.25
46	139.90	6.38	141.60	6.28	139.00	6.30	125.34	6.15
48	146.29	6.39	147.94	6.34	145.35	6.35	131.60	6.26
50	152.60	6.31*	154.25	6.31*	151.71	6.36*	137.82	6.22
52	158.95	6.35	160.60	6.35	158.08	6.37	144.19	6.37
54	165.34	6.39	166.90	6.30	164.40	6.32	150.42	6.23
56	.....	.....	.....	.....	.....	.....	156.78	6.36*
58	.....	.....	.....	.....	.....	.....	163.05	6.27
60	.....	.....	.....	.....	.....	.....	169.40	6.35
		3)19.05		18.96		19.05		18.98
		2)6.35		6.32		6.35		6.3266
		3.1750		3.16		3.175		3.1633
		3.1600						
		3.1750						
		3.1633						
		4)12.6733						
		3.1683 Velocity with a Motive Weight of 12 lbs.						

N. B. The last set of experiments was made on the third of October, 1797.

SATURDAY, September 30, 1797.

Conductor, round bar and cylinder, with a semi-globe fore body, called X, &c.

Thermometer in the Air, 60°;—In the Dock, 59°.—Water in the Dock, 12 ft. 9 in.—Wind, S. W. Fresh Breezes.

System Four-fold.

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.

Accel. Wt. Chain 9 ft. 6 in.			A. W. Chain 9 ft. 6 in.		A. Wt. Chain 9 ft.		A.W. Chain 10 ft. 6 in.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.98	7.98	9.15	9.15	7.70	7.70	7.69	7.69
8	23.99	16.01	25.35	16.20	23.15	15.45	24.20	16.51
12	42.27	18.28	43.65	18.30	40.90	17.75	42.98	18.78
16	60.45	18.18	61.69	18.04	58.85	17.95	61.34	18.36
20	78.69	18.24	79.70	18.01	76.87	18.02	79.55	18.21
24	96.90	18.21	97.90	18.20	95.00	18.13	97.75	18.20
26	106.05	9.15	107.12	9.22	104.15	9.15	106.80	9.05
28	115.29	9.24	116.33	9.21	113.32	9.17	115.89	9.09
30	124.34	9.05	125.39	9.06	142.49	9.17	125.20	9 31
32	133.48	9.14	134.60	9.21	131.73	9.24	134.31	9.11
34	142.74	9.26*	143.78	9.18*	140.93	9.20	143.45	9.14*
36	151.91	9.17	153.03	9.25	150.15	9.22*	152.70	9.25
38	161.09	9.18	162.19	9.16	159.43	9.28	161.90	9.20
40	.....	.....	.....	.....	168.78	9.35	.....	.....
		3)27.61		27.59		27.85		27.59
		2)9.2033		9.1966		9.2833		9.1966
		4.6016		4.5983		4.6416		4.5983
		4.5984						
		4.6416						
		4.5984						
		4)18.4400						
		4.6100 Velocity with a Motive Weight of 24 lbs.						

N. B. The last two sets of experiments were made on the 29th of September.

SATURDAY, September 30, 1797.

Conductor, round bar and cylinder, with a semi-globe fore body, called **X**, &c.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain ft. 9 in. 6			A. Wt. Chain ft. 9 in. 6		A. Wt. Chain ft. 10 in. 3	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.74	3.74	2.75	2.75	4.60	4.60
4	10.80	7.06	9.20	6.45	12.48	7.88
6	20.28	9.48	18.00	8.80	22.30	9.82
8	30.32	10.04	28.09	10.09	33.04	10.74
10	41.03	10.71	38.60	10.51	43.85	10.81
12	51.75	10.72	49.35	10.75	54.79	10.94
14	62.60	10.85	60.20	10.85	65.80	11.01
16	73.51	10.91	71.05	10.85	76.90	11.10
18	84.50	10.99	82.05	11.00	87.90	11.00
20	95.60	11.10	93.20	11.15	99.09	11.19
22	106.85	11.25	104.39	11.19	110.31	11.22
24	118.00	11.15	115.55	11.16	121.71	11.40
26	129.23	11.23	126.85	11.30	132.98	11.27
28	140.58	11.35*	138.18	11.33*	144.44	11.46*
30	152.00	11.42	149.58	11.40	155.85	11.41
32	163.31	11.31	.....	.....	167.35	11.50
		3)34.08		2)22.73		3)34.37
		2)11.36		11.365		11.4566
		5.6800		5.6825		5.7283
		5.6825				
		5.7283				
		3)17.0908				
		5.6969 Velocity with a Motive Weight of 36 lbs.				

SATURDAY, September 30, 1797.

Conductor, round bar and cylinder, with a semi-globe fore body, called X, &c.

System Four-fold.

Total Wt. 197 lbs. Motive Wt. 48 lbs.				
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.10	1.10	1.03	1.03
4	7.93	6.83	12.14	11.11
6	17.98	10.05	23.40	11.26
8	29.97	11.99	35.70	12.30
10	42.70	12.73	48.70	13.00
12	55.80	13.10	61.79	13.09
14	69.11	13.31	75.15	13.36
16	82.28	13.17	88.25	13.10
18	95.73	13.45	101.70	13.45
20	109.18	13.45	115.27	13.57
22	122.79	13.61	128.79	13.52
24	136.39	13.60*	142.39	13.60*
26	149.94	13.55	156.04	13.65
28	153.55	13.61	169.54	13.50
		3)40.76		40.75
		2)13.5866		13.5833
		6.7933		6.7916
		6.7917		
		2)13.5850		
		6.7925 Velocity with a Motive Wt. of 48 lbs.		

System Four-fold.

Total Weight 294 lbs. Motive Wt. 72 lbs.				
Accel. Wt. Chain 11 ft.			A. Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.70	6.70	4.90	4.90
4	18.24	11.54	15.70	10.80
6	32.59	14.35	29.50	13.80
8	48.40	15.81	44.94	15.44
10	64.78	16.38	61.24	16.30
12	81.24	16.46	77.55	16.31
14	98.07	16.83	94.30	16.75
16	115.04	16.97	111.09	16.79
18	132.27	17.23*	128.20	17.11*
20	149.15	16.88	145.39	17.19
22	166.10	16.95	162.30	16.91
		3)51.06		51.21
		2)17.02		17.07
		8.510		8.535
		8.535		
		2)17.045		
		8.5225 Velocity with a Motive Wt. of 72 lbs.		

Conductor, round bar and cylinder, with semi-globe fore and after bodies, called Y, immersed six feet.

	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	3.2533	4.7738	5.9883	7.0967	.....	8.5925	.....	.....
Correction for Line	.....	3.2699	4.7981	6.0249	7.1400	.....	8.6639	.....	.....
Hutt. Correction, or Regular Series	2.2285	3.2548	4.7534	5.9324	6.9422	7.8424	8.6639	10.139	11.454

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3842	4.9218	10.336	17.500	26.328	36.754	48.734	62.225	77.194	93.610	111.45	130.69	162.72
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.408	54.543	65.541	77.39	90.06	110.97
Resistance and Friction....	0.2001	0.9577	2.299	4.232	6.751	9.856	13.545	17.817	22.657†	28.069	34.06	40.63	51.75
Friction on 3.5448 feet....	0.0132	0.0507	0.111	0.194	0.299	0.425	0.573	0.741	0.930	1.140	1.37	1.62	2.04
Plus and Minus Pressures..	0.1869	0.9070	2.188	4.038	6.452	9.431	12.972	17.076	21.727‡	26.929	32.69	39.01	49.71

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
12 and	24	1.8077							
	36	1.7979	24..36	1.7808					
	48	1.7752	48	1.7438	36..48	1.6941			
	72	1.8388	72	1.8591	72	1.9081	48..72	2.0959	
							10)	18.3014	
							Mean 12 lbs. and 72 lbs..	1.8301	

† Query 22.651?

‡ Query 21.721?

FRIDAY, September 29, 1797.

Conductor, round bar and cylinder, with semi-globe fore and after bodies, called Y, immersed six feet.

Thermometer in the Air, 65;—In the Dock, 59½°.—Water in the Dock, 12 ft. 9 in.—Wind, Southerly. Light Airs.

System Four-fold.

Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.						
Accel. Wt. Chain 8 ft.			A. Wt. Chain 8 ft.		A. Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.95	5.95	3.70	3.70	5.35	5.35
8	17.75	11.80	14.85	11.15	16.84	11.49
12	31.60	13.85	28.53	13.68	30.60	13.76
16	45.00	13.40	42.19	13.66	44.30	13.70
20	58.25	13.25	55.35	13.16	57.40	13.10
24	71.12	12.87	68.35	13.00	70.32	12.92
28	83.95	12.83	81.24	12.89	83.15	12.83
32	96.84	12.89	94.10	12.86	96.00	12.85
36	109.67	12.83	106.93	12.83	108.92	12.92
40	122.60	12.93	119.71	12.78	121.80	12.88
42	129.02	6.42	125.94	6.23	128.35	6.55
44	135.54	6.52	132.23	6.29	134.82	6.47
46	141.98	6.44	138.97	6.74	141.29	6.47
48	148.50	6.52*	145.50	6.53*	147.83	6.54*
50	154.94	6.44	151.87	6.37	154.39	6.56
52	161.40	6.46	158.29	6.42	160.95	6.56
54	167.94	6.54	164.98	6.69	167.40	6.45
		4)25.96		26.01		26.11
		2)6.49		6.5025		6.5275
		3.2450		3.2512		3.2637
		3.2512				
		3.2637				
		3)9.7599				
		3.2533 Velocity with a Motive Weight of 12 lbs.				

FRIDAY, September 29, 1797.

Conductor, round bar and cylinder, with semi-globe fore and after bodies, called Y, &c.

System Four-fold.

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.						
Accel. Wt. Chain 11 ft.			A. Wt. Chain 11 ft.		A. Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.90	8.90	5.15	5.15	6.75	6.75
8	26.69	17.79	21.35	16.20	23.85	17.10
12	46.69	20.00	40.99	19.54	43.76	19.91
16	66.53	19.84	60.63	19.64	63.40	19.64
20	85.82	19.29	79.85	19.22	82.74	19.34
24	104.97	19.15	98.82	18.97	101.97	19.23
26	114.60	9.63	108.35	9.53	111.50	9.53
28	124.02	9.42	117.75	9.40	121.07	9.57
30	133.60	9.58	127.20	9.45	130.54	9.47
32	143.19	9.59*	136.73	9.53	140.03	9.49
34	152.63	9.44	146.32	9.59*	149.52	9.49*
36	162.30	9.67	155.80	9.48	159.05	9.53
38	.....	.....	165.32	9.52	168.67	9.62
		3)28.70		28.59		28.64
		2)9.5666		9.53		9.5466
		4.7833		4.765		4.7733
		4.7650				
		4.7733				
		3)14.3216				
		4.7738 Velocity with a Motive Weight of 24 lbs.				

FRIDAY, September 29, 1797.

Conductor, round bar and cylinder, with semi-globe fore and after bodies, called Y, &c.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain 11 ft.			A. Wt. Chain 11 ft.		A. Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	10.95	10.95	14.10	14.10	13.80	13.80
8	32.18	21.23	36.20	22.10	35.93	22.13
12	55.45	23.27	59.74	23.54	59.35	23.42
16	78.80	23.35	83.15	23.41	82.60	23.25
20	102.22	23.42	106.65	23.50	105.98	23.38
22	113.96	11.74	118.53	11.88	117.75	11.77
24	125.75	11.79	130.49	11.96	129.65	11.90
26	137.65	11.90*	142.53	12.04*	141.64	11.99*
28	149.53	11.88	154.50	11.97	153.70	12.06
30	161.49	11.96	166.50	12.00	165.69	11.99
		3)35.74		36.01		36.04
		2)11.9133		12.0033		12.0133
		5.9566		6.0016		6.0066
		6.0016				
		6.0066				
		3)17.9648				
		5.9883 Velocity with a Motive Weight of 36 lbs.				

FRIDAY, September 29, 1797.

Conductor, round bar and cylinder, with semi-globe fore and after bodies, called Y, &c.

System Four-fold.

Total Weight 197 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain 8 ft.			A.Wt. Chain 11 ft.		A.Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.20	4.20	5.38	5.38	5.35	5.35
4	12.94	8.74	14.73	9.35	14.98	9.63
6	23.95	11.01	26.65	11.92	26.99	12.01
8	36.25	12.30	39.67	13.02	40.23	13.24
10	49.26	13.01	53.20	13.53	53.74	13.51
12	62.59	13.33	66.60	13.40	67.55	13.81
14	76.18	13.59	80.35	13.75	81.30	13.75
16	89.73	13.55	94.25	13.90	95.35	14.05
18	103.75	14.02	108.15	13.90	109.34	13.99
20	117.78	14.03	122.15	14.00	123.50	14.16
22	131.83	14.05	136.30	14.15	137.70	14.20
24	145.98	14.15*	150.43	14.13*	151.95	14.25*
26	160.15	14.17	164.61	14.18	166.23	14.28
		2)28.32		28.31		28.53
		2)14.16		14.155		14.265
		7.0800		7.0775		7.1325
		7.0775				
		7.1325				
		3)21.2900				
		7.0967 Velocity with a Motive Weight of 48 lbs.				

FRIDAY, September 29, 1797.

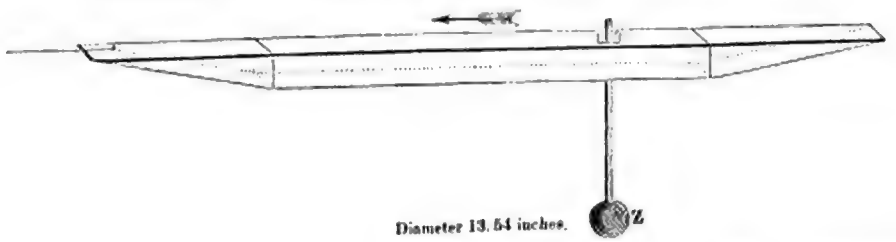
Conductor, round bar, and cylinder, with semi-globe fore and after bodies, called Y, &c.

System Four-fold.

Total Weight 294 lbs.			Motive Weight 72 lbs.	
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.27	6.27	7.70	7.70
4	17.94	11.67	20.40	12.70
6	32.93	14.99	35.41	15.01
8	49.12	16.19	51.80	16.39
10	65.80	16.68	68.59	16.79
12	82.95	17.15	85.55	16.96
14	99.84	16.89	102.64	16.09
16	116.98	17.14	119.63	16.99
18	134.19	17.21*	136.94	17.31*
20	151.35	17.16	154.00	17.06
		2)34.37		34.37
		2)17.185		17.185
		8.5925		8.5925
		8.5925		
		2)17.1850		
		8.5925 Velocity with a Motive Weight of 72 lbs.		

N. B. This body trembled in a small degree.

Conductor, round bar, and globe, called Z, immersed six feet.



	Motive Weights.								
	6	12	24	36	48	60	72	96	120
Velocity per Experiment.....	.....	3.1144	4.4916	6.5875	6.5883	.....	8.3181	9.7183	.....
Correction for Line	.....	3.1303	4.5145	5.6216	6.6285	.....	8.3873	9.7991	.....
Hutt. Correction, or Regular Series	2.0933	3.0741	4.5140	5.6515	6.6285	7.5013	8.2989	9.7337	11.015

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.5823	5.5255	11.483	19.295	28.862	40.104	52.962	67.389	83.345	100.79	119.70	140.04	173.82
Conductor and Bar	1.1841	3.9641	8.037	13.268	19.577	26.898	35.189	44.408	54.543	65.54	77.39	90.06	110.97
Resistance and Friction....	0.3982	1.5614	3.446	6.027	9.285	13.206	17.773	22.981	28.802	35.25	42.31	49.98	62.85

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.										
12 and	24	1.8930									
	36	1.8764	24..36	1.8487							
	48	1.8478	48	1.8047	36..48	1.7461					
	72	1.8180	72	1.7736	72	1.7325	48..72	1.7229			
	96	1.8222	96	1.7888	96	1.7651	96	1.7731	72..96	1.8492	

15)27.0621

Mean 24 lbs. and 48 lbs. 1.8041

WEDNESDAY, August 23, 1797.

Conductor, round bar, and globe, called Z, immersed six feet.

Thermometer in the Air, 65°;—In the Dock, 64°.—Water in the Dock, 12 ft. 3 in.—Wind, N.W. Moderate.

System Four-fold.

Total Wt. 49 lbs. 11 oz.			M. Wt. 12 lbs.	
Accel. Wt. Chain 8 ft.			A. Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	10.55	10.55	6.85	6.85
8	23.45	12.90	18.40	11.55
12	36.40	12.95	31.40	13.00
16	48.99	12.59	43.87	12.47
20	61.45	12.46	56.09	12.22
24	73.72	12.27	68.29	12.20
28	85.99	12.27	80.53	12.24
32	98.26	12.27	92.79	12.26
36	110.65	12.39	105.07	12.28
40	123.05	12.40	117.35	12.28
42	129.26	6.21	129.90	12.55
44	135.50	6.24	136.21	6.31
46	141.76	6.26	142.31	6.10
48	147.98	6.22*	148.50	6.19*
50	154.19	6.21	154.80	6.30
52	160.45	6.26	160.98	6.18
54	166.72	6.27	167.18	6.20
		4)24.96		24.87
		2)6.24		6.2175
		3.1200		3.1087
		3.1087		
		2)6.2287		
		3.1143	Velocity with a Motive Weight of 12 lbs.	

WEDNESDAY, August 23, 1797.

Conductor, round bar, and globe, called Z, &c.

System Four-fold.

Total Weight 99 lbs. 12 oz. Motive Weight 24 lbs.						
Accel. Wt. Chain 8 ft. 6 in.			A. Wt. Chain 9 ft. 6 in.		A. Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.87	2.87	6.50	6.50	3.71	3.71
4	8.39	5.52	13.80	7.30	9.87	6.16
6	16.20	7.81	22.55	8.75	17.65	7.78
8	24.70	8.50	31.45	8.90	26.25	8.60
10	33.55	8.85	40.41	8.96	34.98	8.73
12	42.35	8.80	49.40	8.99	43.75	8.77
14	51.15	8.80	58.09	8.69	52.60	8.85
16	59.85	8.70	66.96	8.87	61.45	8.85
18	68.61	8.76	75.89	8.93	70.19	8.78
20	77.48	8.87	84.86	8.97	79.07	8.88
22	86.29	8.81	93.85	8.99	88.00	8.93
24	95.21	8.92	102.65	8.80	96.85	8.85
26	104.10	8.89	111.70	9.05	105.73	8.88
28	112.95	8.85	120.68	8.98	114.59	8.86
30	121.85	8.90	129.71	9.03	123.59	9.00
32	130.85	9.00	138.70	8.99*	132.45	8.86
34	139.84	8.99*	147.65	8.95	141.38	8.93*
36	148.80	8.96	156.57	8.92	150.39	9.01
38	157.75	8.95	165.60	9.03	159.43	9.04
40	166.81	9.06	.....	.....	168.40	8.97
		4)35.96		35.89		35.95
		2)8.99		8.9725		8.9875
		4.4950		4.4862		4.4937
		4.4862				
		4.4937				
		3)13.4749				
		4.4916 Velocity with a Motive Weight of 24 lbs.				

TUESDAY, August 22, 1797.

Conductor, round bar, and globe, called Z, &c.

Thermometer in the Air, 65°;—In the Dock, 65°.—Water in the Dock, 12 ft. 3 in.—Wind, N. W. Moderate.

System Four-fold.

Total Weight 148 lbs. Motive Weight 36 lbs.

Accel. Weight, Chain 11 ft.			Accel. Wt. Chain 8 ft.		Accel. Wt. Chain 8 ft.		A. Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.65	3.65	2.52	2.52	2.05	2.05	5.60	5.60
4	11.40	7.75	8.90	6.38	8.05	6.00	14.00	8.40
6	21.20	9.80	18.00	9.10	17.20	9.15	24.05	10.05
8	32.12	10.92	27.95	9.95	27.20	10.00	34.53	10.48
10	43.45	11.33	38.82	10.87	37.72	10.52	45.25	10.72
12	54.68	11.23	49.60	10.78	48.40	10.68	56.00	10.75
14	65.74	11.06	60.50	10.90	59.20	10.80	66.90	10.90
16	76.67	10.93	71.48	10.98	69.90	10.70	77.81	10.91
18	87.80	11.13	82.52	11.04	80.60	10.70	88.88	11.07
20	98.60	11.20	93.40	10.88	91.40	10.80	99.75	10.87
22	109.72	11.12	104.42	11.02	102.20	10.80	110.90	11.15
24	120.82	11.10	115.56	11.14	113.18	10.98	122.00	11.10
26	132.04	11.22*	126.65	11.09	124.10	10.92	133.16	11.16*
28	143.20	11.16	137.80	11.15*	135.10	11.00*	144.30	11.14
30	.....	.....	149.10	11.30	146.20	11.10	155.45	11.15
32	.....	.....	160.35	11.25	157.35	11.15	166.62	11.17
34	.....	.....	171.53	11.18	168.64	11.29	.....	.....
		2)22.38		4)44.88		44.54		44.62
		2)11.19		11.22		11.135		11.155
		5.5950		5.61		5.5675		5.5775
		5.6100						
		5.5675						
		5.5775						
		4)22.3500						
		5.5875 Velocity with a Motive Weight of 36 lbs.						

WEDNESDAY, August 23, 1797.

Conductor, round bar, and globe, called Z, &c.

System Four-fold.

Total Weight 197 lbs. Motive Weight 48 lbs.

Accel. Wt. Chain ft. 11 in. 6			A. Wt. Chain ft. 11 in. 6		A. Wt. Chain ft. 11 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.25	5.25	7.62	7.62	1.70	1.70
4	14.53	9.28	18.35	10.73	8.85	7.15
6	26.05	11.52	30.55	12.20	19.31	10.46
8	38.51	12.46	43.24	12.69	31.44	12.13
10	51.35	12.84	55.95	12.71	44.03	12.59
12	64.10	12.75	68.79	12.84	56.62	12.59
14	76.85	12.75	81.79	13.00	69.49	12.87
16	89.60	12.75	94.86	13.07	82.29	12.80
18	102.48	12.88	107.90	13.04	95.30	13.01
20	115.64	13.16	121.19	13.29	108.38	13.08
22	128.50	12.86	134.48	13.29	121.53	13.15
24	141.52	13.02*	147.58	13.10*	134.99	13.46
26	154.65	13.13	160.89	13.31	148.38	13.39*
28	.....	.....	.....	.....	161.49	13.11
		2)26.15		26.41		26.50
		2)13.075		13.205		13.25
		6.5375		6.6025		6.625
		6.6025				
		6.6250				
		3)19.7650				
		6.5883 Velocity with a Motive Weight of 48 lbs.				

WEDNESDAY, August 23, 1797.

Conductor, round bar, and globe, called Z, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

	Accel. Wt. Chain ft. 10		A. Wt. Chain ft. 10		A. Wt. Chain ft. 10		A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.30	5.30	1.65	1.65	6.79	6.79	2.68	2.68
4	16.75	11.45	10.12	8.47	19.05	12.26	11.95	9.27
6	31.15	14.40	20.95†	12.83	33.36	14.31	25.15	13.20
8	46.45	15.30	37.80	14.85	48.81	15.45	40.12	14.96
10	62.55	16.10	53.50	15.70	64.75	15.94	55.82	15.70
12	78.70	16.15	69.50	16.00	80.90	16.15	72.09	16.27
14	95.20	16.50	85.90	16.40	97.45	16.55	88.65	16.56
16	111.40	16.20	102.35	16.45	114.26	16.81*	105.48	16.83
18	127.82	16.42	118.70	16.35	130.90	16.64	122.15	16.67
20	144.20	16.38*	135.24	16.54	.....	.....	138.90	16.75*
22	160.80	16.60	151.74	16.50*	.....	.....	155.81	16.91
24	.....	.....	168.24	16.50	.....	.....	.....	.....
		2)32.98		33.00		33.45		33.66
		2)16.49		16.50		16.725		16.83
		8.2450		8.25		8.3625		8.415
		8.2500						
		8.3625						
		8.4150						
		4)33.2725						
		8.3181 Velocity with a Motive Weight of 72 lbs.						

† Query 22.95?

N.B. The first two sets of experiments were made on the 22nd of August.

WEDNESDAY, August 23, 1797.

Conductor, round bar, and globe, called **Z**, &c.

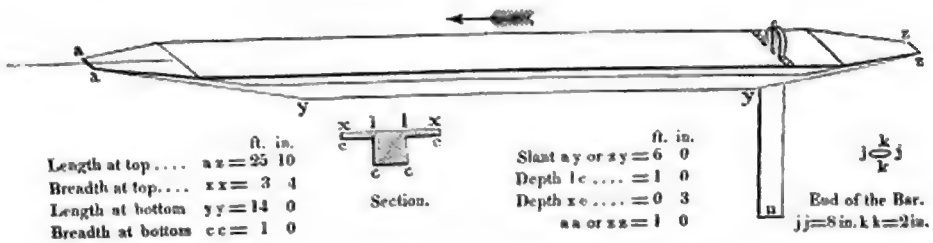
System Four-fold.

Total Weight 395 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10		A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	11.00	11.00	4.65	4.65	4.29	4.29
4	26.51	15.51	17.19	12.54	16.90	12.61
6	44.25	17.74	33.80	16.61	33.80	16.28
8	62.85	18.60	51.98	18.18	51.25	18.07
10	81.84	18.99	71.11	19.13	69.96	18.71
12	101.19	19.25	90.48	19.37	89.40	19.44
14	120.65	19.46	110.07	19.59	108.64	19.24
16	140.12	19.47*	129.65	19.58*	128.25	19.61*
18	159.50	19.38	148.98	19.33	147.50	19.25
		2)38.85		38.91		38.86
		2)19.425		19.455		19.43
		9.7125		9.7275		9.715
		9.7275				
		9.7150				
		3)29.1550				
		9.7183 Velocity with a Motive Weight of 96 lbs.				

GENERAL TABLE, 1797.

	Table	Feet per Second.												
		1	2	3	4	5	6	7	8	9	10	11	12	13.527
Conductor and Round Bar.	113	1.1811	3.9041	8.0888	13.268	19.577	26.898	35.189	44.468	54.593	65.540	77.387	90.061	110.97
Triangle M, vertex foremost	421	0.3773	1.8915	3.925	6.588	9.839	13.655	18.022	22.925	28.304	34.202	40.59	47.46	58.85
..... M, base foremost	425	0.9633	4.0518	9.283	16.660	26.138	37.745	51.452	67.27	85.15	105.11	127.14	151.23	191.99
Cube R	430	0.9287	4.1048	9.631	17.516	27.857	40.581	55.715	73.25	93.23	115.61	140.41	167.64	213.88
Square Plane S	437	1.2919	4.9463	10.931	19.018	29.279	41.585	55.927	72.27	90.59	110.86	133.05	157.20	197.71
Round Plane T	445	1.0738	4.3707	9.859	17.568	27.287	39.179	53.133	69.22	87.33	107.49	129.68	153.91	194.78
Cylinder U	452	0.8893	3.7656	8.737	15.852	25.052	36.333	49.775	65.29	82.89	102.58	124.37	148.24	188.71
Cylinder S, Globe W after-body	459	0.7116	3.1401	7.402	13.401	21.002	31.498	43.227	56.83	72.28	89.60	108.77	129.82	165.52
Cylinder S, Globe X fore-body	463	0.3179	1.3413	2.944	5.106	7.836	11.114	14.923	19.258	24.092	29.441	35.28	41.61	52.26
Cylinder S, Globe Y fore & after bodies	468	0.2001	0.9577	2.298	4.232	6.751	9.856	13.545	17.817	22.651	28.069	34.06	40.63	51.79
Globe Z	474	0.3882	1.3614	3.146	6.027	9.285	13.296	17.773	22.981	28.802	35.25	42.31	49.89	62.85

New Conductor and broad bar n, immersed 5 feet 6 inches.



	ft.	in.
Length at top	a z = 25	10
Breadth at top	x x = 3	4
Length at bottom	y y = 14	0
Breadth at bottom	c c = 1	0

Section.

	ft.	in.
Slant a y or z y =	6	0
Depth l c .... =	1	0
Depth x e .... =	0	3
a a or z z =	1	0

End of the Bar.
j j = 8 in. k k = 2 in.

	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	4.5446	6.1512	7.3543	8.2691	.....	9.925	.....	.....
Correction for line.....	4.5677	6.1826	7.3992	8.3195	.....	10.007	.....	.....
Hutt. Correction, or Regular Series	4.5898	6.2052	7.4021	8.3889	9.2440	10.007	11.341	12.497

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.3613	1.7778	4.5151	8.7473	14.609	22.215	31.662	43.038	56.423	71.884	89.493	109.31	143.97

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.		lbs.	
12 and	24	2.2897						
	36	2.2828	24..36	2.2572				
	48	2.3121	48	2.3348	36..48	2.4540		
	72	2.2846	72	2.2815	72	2.2958	48..72	2.1954

10) 22.9879

Mean 36 lbs. and 72 lbs. ... 2.2988

WEDNESDAY, September 27, 1798.

New Conductor and broad bar, immersed 5 feet 6 inches.

Thermometer in the Air, 57½°;—In the Dock, 59½°.—Water in the Dock, 10 feet.—Wind, W.N.W. Moderate.

System Four-fold.

Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 10			Accel. Wt. Chain ft. 10		Accel. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.55	7.55	8.78	8.78	5.82	5.82
8	21.15	13.60	23.11	14.33	18.55	12.73
12	37.73	16.58	39.56	16.45	34.67	16.12
16	55.10	17.37	56.94	17.38	51.92	17.25
20	72.50	17.40	74.32	17.38	69.40	17.48
24	90.10	17.60	91.75	17.43	87.06	17.66
28	107.85	17.75	109.35	17.60	104.76	17.70
30	116.90	9.05	118.20	8.95	113.70	8.94
32	125.90	9.00	127.10	8.90	122.60	8.90
34	134.95	9.05	136.00	8.90	131.70	9.10
36	144.05	9.10*	145.00	9.00*	140.70	9.00*
38	153.20	9.15	154.00	9.00	149.80	9.10
40	162.30	9.10	163.05	9.05	158.92	9.12
42	171.50	9.20	172.10	9.05	168.12	9.20
		4)36.55		36.10		36.42
		2)9.1375		9.025		9.105
		4.5687		4.5125		4.5525
		4.5125				
		4.5525				
		3)13.6337				
		4.5446 Velocity with a Motive Weight of 12 lbs.				

WEDNESDAY, September 27, 1798.

New Conductor and broad bar, immersed 5 feet 6 inches.

System Four-fold.

Total Wt. 97 lbs. 12 oz.			Motive Wt. 24 lbs.	
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.57	2.57	3.00	3.00
4	7.80	5.23	8.55	5.55
6	15.12	7.32	16.40	7.85
8	24.10	8.98	25.75	9.35
10	34.20	10.10	36.12	10.37
12	45.05	10.85	47.00	10.88
14	56.20	11.15	58.20	11.20
16	67.73	11.53	69.90	11.70
18	79.50	11.77	81.68	11.78
20	91.42	11.92	93.82	12.14
22	103.50	12.08	105.98	12.16
24	115.70	12.20	118.20	12.22
26	128.00	12.30*	130.50	12.30*
28	140.27	12.27	142.85	12.35
30	152.55	12.28	155.20	12.35
32	164.75	12.20	167.57	12.37
		4)49.05		49.37
		2)12.2625		12.3425
		6.1312		6.1712
		6.1712		
		2)12.3024		
		6.1512 Velocity with a Motive Wt. of 24 lbs.		

System Four-fold.

Total Wt. 147 lbs.			Motive Wt. 36 lbs.	
Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.80	2.80	3.30	3.30
4	9.50	6.70	10.93	7.63
6	19.65	10.15	20.05	9.12
8	32.30	12.65	33.40	13.35
10	46.00	13.70	46.95	13.55
12	60.20	14.20	61.52	14.57
14	74.85	14.65	76.40	14.88
16	89.33	14.48	90.67	14.27
18	103.90	14.57	105.67	15.00
20	118.55	14.65*	120.42	14.75*
22	133.23	14.68	135.22	14.80
24	147.80	14.57	140.00	14.78
26	162.46	14.66	164.78	14.78
		4)58.56		59.11
		2)14.64		14.7775
		7.3200		7.3887
		7.3887		
		2)14.7087		
		7.3543 Velocity with a Motive Wt. of 36 lbs.		

WEDNESDAY, September 27, 1798.

New Conductor and broad bar, immersed 5 feet 6 inches.

System Four-fold.

T. Wt. 195 lbs 4 oz.			M. Wt. 48 lbs.	
Accel. Wt. Chain	ft. 14	in. 6	A. Wt. Chain	ft. 14 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.80	6.80	3.45	3.45
4	17.80	11.00	11.90	8.45
6	31.80	14.00	24.05	12.15
8	47.05	15.25	38.30	14.25
10	63.15	16.10	54.00	15.70
12	79.40	16.25	70.50	16.50
14	95.76	16.36	86.70	16.20
16	112.20	16.44	103.00	16.30
18	128.70	16.50*	119.70	16.70*
20	145.12	16.42	136.20	16.50
22	161.68	16.56	152.75	16.55
		3)49.48		49.75
		2)16.4933		16.5833
		8.2466		8.2916
		8.2916		
		2)16.5382		
		8.2691	Velocity with a Motive Weight of 48 lbs.	

Digitized by Google

TUESDAY, September 26, 1798.

New Conductor and broad bar, immersed 5 feet 6 inches.

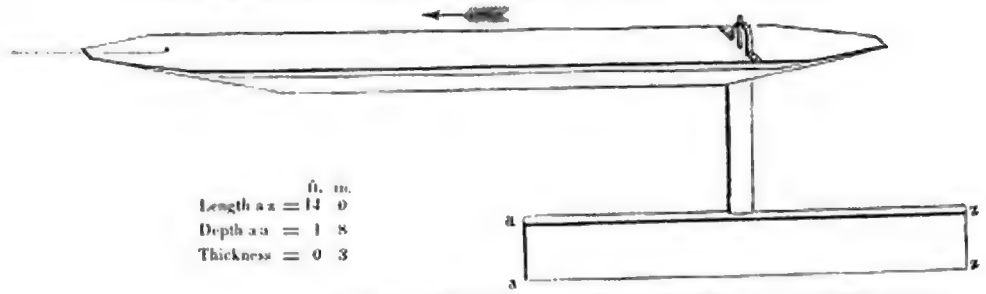
Thermometer in the Air, 60°;—In the Dock, 60½°.—Water in the Dock, 11 feet.—Wind, West. Fresh Breeze.

System Four-fold.

Total Weight 296 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.		A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.70	5.70	5.35	5.35	8.00	8.00
4	17.00	11.30	16.35	11.00	21.18	13.18
6	32.23	15.23	31.50	15.15	38.05	16.97†
8	49.75	17.52	48.95	17.45	56.52	18.47
10	67.90	18.15	67.22	18.27	75.30	18.78
12	86.85	18.95	86.28	19.06	94.70	19.40
14	106.14	19.29	105.65	19.37	114.15	19.45
16	125.90	19.76	125.30	19.65	134.20	20.05*
18	145.60	19.70*	145.05	19.75*	153.90	19.70
20	165.40	19.80	165.15	20.10	.....	.....
		2)39.50		39.85		39.75
		2)19.75		19.925		19.875
		9.8750		9.9625		9.9375
		9.9625				
		9.9375				
		3)29.7750				
		9.925 Velocity with a Motive Weight of 72 lbs.				

† Query 16.87?

New Conductor, broad bar, and Friction Plank, immersed six feet.



	ft.	in.
Length a x	= 14	0
Depth a a	= 1	8
Thickness	= 0	3

	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.3908	4.8633	5.8116	6.5991	7.2764	8.0875	9.2440	10.1946
Correction for Line	3.4081	4.8881	5.8471	6.6393	7.3208	8.1546	9.3207	10.2792
Hutt. Correction, or Regular Series	3.4183	4.7451	5.7488	6.5872	7.3208	7.9804	9.1442	10.1620

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.8935	3.8659	9.1071	16.728	26.806	39.404	54.579	72.374	92.829	115.98	141.86	170.50	219.64
Short Friction Plank	0.7300	3.2126	7.6460	14.146	22.797	33.666	46.812	62.282	80.124	100.37	123.07	148.24	191.51
Friction on 46 feet	0.1635	0.6533	1.4611	2.572	4.009	5.738	7.767	10.092	12.705	15.61	18.79	22.26	28.13
Friction on 50 feet	0.1777	0.7101	1.5882	2.7957	4.3576	6.2370	8.4424	10.970	13.810	16.967	20.424	24.195	30.576
Friction in 1796 (p. 239)	0.1925	0.7225	1.5620	2.7040	4.1350	5.8550	7.8560	10.130	12.680	15.500	18.590	21.940	27.560
Friction in 1796 (p. 397)	0.1871	0.7112	1.5522	2.7010	4.1500	5.8950	7.9320	10.260	12.869	15.760	18.930	22.390	28.180
Total	0.5573	2.1438	4.7024	8.2007	12.6426	17.9870	24.2304	31.360	39.359	48.227	57.944	68.525	86.316
Mean	0.1858	0.7146	1.5675	2.7336	4.2142	5.9957	8.0768	10.453	13.119	16.076	19.315	22.842	28.772

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.																
12 and	24	1.9219															
	36	2.0352	24..36	2.2634													
	48	2.0788	48	2.2637	36..48	2.2641											
	60	2.1050	60	2.2685	60	2.2726	48..60	2.2837									
	72	2.0538	72	2.1467	72	2.0838	72	1.9724	60..72	1.6903							
	96	2.0668	96	2.1478	96	2.1034	96	2.0432	96	1.9460	72..96	2.1524					
	120	2.0857	120	2.1653	120	2.1341	120	2.0963	120	2.0424	120	2.2064	96..120	2.2801			

28)59.1738

Mean 12 lbs. and 60 lbs.. 2.1133

The Law of the Friction	1.9434	1.9373	1.9332	1.9397	1.9338	1.9329	1.9313	1.9287	1.9292	1.9259	1.9275	1.9264

TUESDAY, November, 6, 1798.

New Conductor, broad bar, and Friction Plank, immersed six feet.

Thermometer in the Air, 47°;—In the Dock, 49°.—Water in the Dock, 12 ft. 6 in.—Wind, W.N.W. Moderate Breeze.

System Four-fold.

Total Weight 52 lbs.			Motive Wt. 12 lbs.	
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.75	5.75	3.55	3.55
8	16.35	10.60	12.95	6.45§
12	29.62	13.27	25.50	12.55
16	43.57	13.95	39.25	13.75
20	57.30	13.73	53.12	13.87
24	70.72	13.42	66.68	13.56
28	84.15	13.43	79.92	13.24
32	97.63	13.48	93.32	13.40
36	111.00	13.37	106.65	13.33
40	124.42	13.42	120.00	13.35
44	127.90†	13.48	133.32	13.32
46	140.70‡	6.80	140.10	6.78
48	151.48	6.78	146.78	6.68
50	158.26	6.78*	153.60	6.82*
52	165.06	6.80	160.35	6.75
54	171.85	6.79	167.10	6.75
		3)20.37		20.32
		2)6.79		6.7733
		3.3950		3.3866
		3.3866		
		2)6.7816		
		3.3908	Velocity with a Motive Weight of 12 lbs.	

† Should be 137.90? ‡ Should be 144.70? § Should be 9.40?

TUESDAY, November 6, 1798.

New Conductor, broad bar, and Friction Plank, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.		A. Wt. Chain 12 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.70	5.70	8.00	8.00	7.65	7.65
8	18.70	13.70†	23.40	15.40	22.75	15.10
12	36.50	17.80	41.90	18.50	41.25	18.50
16	55.60	19.10	61.10	19.20	60.62	19.37
20	74.90	19.30	80.20	19.10	79.85	19.23
24	94.00	19.10	99.60	19.40	99.12	19.27
28	113.20	19.20	118.92	19.32	118.50	19.38
32	132.42	19.22	128.63	9.71	128.14	9.64
34	142.13	9.71	138.20	9.57	137.80	9.66
36	151.87	9.74*	148.00	9.80*	147.50	9.70*
38	161.60	9.73	157.70	9.70	157.26	9.76
40	171.30	9.70	167.42	9.72	166.95	9.69
		3)29.17		29.22		29.15
		2)9.7233		9.74		9.7166
		4.8617		4.87		4.8583
		4.8700				
		4.8583				
		3)14.5900				
		4.8633 Velocity with a Motive Weight of 24 lbs.				

† Should be 13.00?

TUESDAY, November 6, 1798.

New Conductor, broad bar, and Friction Plank, &c.

System Four-fold.

Total Weight 146 lbs.			Motive Weight 36 lbs.			
Accel. Wt. Chain ft. 11			A. Wt. Chain ft. 11		A. Wt. Chain ft. 11	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	14.90†	10.90	9.72	9.72	9.60	9.60
8	29.60	18.70	27.65	17.93	27.55	17.95
12	51.38	21.78	49.16‡	21.45	49.05	21.50
16	73.90	22.52	71.40	22.30	71.40	22.35
20	96.70	22.80	94.00	22.60	94.05	22.65
22	108.22	11.52	105.40	11.40	105.58	11.53
24	119.78	11.56	116.90	11.50	117.10	11.52
26	131.40	11.62	128.42	11.52	128.78	11.68
28	143.00	11.60*	140.08	11.66	140.35	11.57*
30	154.70	11.70	151.65	11.57*	152.02	11.67
32	166.32	11.62	163.22	11.57	163.75	11.73
34	.....	.....	174.80	11.58	.....	.....
		3)34.92		34.72		34.97
		2)11.64		11.5733		11.6566
		5.8200		5.7866		5.8283
		5.7866				
		5.8284				
		3)17.4350				
		5.8116 Velocity with a Motive Weight of 36 lbs.				

† Query 10.90? ‡ Query 49.10?

TUESDAY, November 6, 1798.

New Conductor, broad bar, and Friction Plank, &c.

System Four-fold

Total Weight 196 lbs.			Motive Wt. 48 lbs.	
Accel. Wt. Chain 11 ft.			A. Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.90	4.90	6.10	6.10
4	12.72	7.82	14.80	18.70†
6	22.95	10.23	25.70	10.90
8	34.60	11.65	37.57	11.87
10	46.78	12.18	50.00	12.43
12	59.55	12.77	62.80	12.80
14	72.20	12.65	75.70	12.90
16	85.10	12.90	88.74	13.04
18	98.12	13.02	101.93	13.19
20	111.32	13.20	115.15	13.22
22	124.55	13.23	128.43	13.28*
24	137.75	13.20*	141.73	13.30
26	150.90	13.15	155.03	13.30
28	164.20	13.30	.....	.....
		3)39.65		39.88
		2)13.2166		13.2933
		6.6083		6.6466

System Four-fold.

Total Wt. 196 lbs.			Motive Wt. 48 lbs.	
Accel. Wt. Chain 11 ft.			A. Wt. Chain 11 ft.	
Sec.	Feet	Differences.	Feet.	Differences.
2	5.12	5.12	5.00	5.00
4	13.00	7.88	13.05	8.05
6	23.15	10.15	23.40	10.35
8	34.78	11.63	34.90	11.50
10	47.10	12.32	47.27	12.37
12	59.65	12.55	59.98	12.71
14	72.40	12.75	72.75	12.77
16	85.20	12.80	85.62	12.87
18	98.30	13.10	98.65	13.03
20	111.30	13.00	111.75	13.10
22	124.50	13.20	124.95	13.20
24	137.63	13.13*	138.05	13.10*
26	150.82	13.19	151.20	13.15
28	164.00	13.18	164.30	13.10
		3)39.50		39.35
		2)13.1666		13.1166
		6.5833		6.5583
		6.5583		
		6.6467		
		6.6083		
		4)26.3966		
		6.5992	Velocity with a Motive Weight of 48 lbs.	

† Query 8.70?

TUESDAY, November 6, 1798.

New Conductor, broad bar, and Friction Plank, &c.

System Four-fold

Total Weight 245 lbs. Motive Weight 60 lbs.

Accel. Wt. Chain ft. 11			A. Wt. Chain ft. 11		A. Wt. Chain ft. 11		A. Wt. Chain ft. 11	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.00	4.00	6.20	6.20	7.83	7.83	4.92	4.92
4	11.90	7.90	15.70	9.50	18.75	10.92	13.35	8.43
6	22.80	10.90	27.65	11.95	13.35	12.60	24.75	11.40
8	35.30	12.50	40.85	13.20	44.85	13.50	37.30	12.55
10	48.92	13.62	54.55	13.70	58.95	14.10	51.05	13.75
12	63.00	14.08	68.72	14.17	73.00	14.05	65.05	14.00
14	77.30	14.30	82.93	14.21	87.30	14.30	79.20	14.15
16	91.67	14.37	97.40	14.47	101.78	14.48	93.50	14.30
18	106.18	14.51	111.75	14.35	116.35	14.57	107.90	14.40
20	120.63	14.45	126.42†	14.47	130.80	14.45	122.47	14.57
22	135.10	14.47*	140.62	14.40	145.40	14.60*	136.97	14.50
24	149.51	14.41	155.12	14.50*	159.85	14.45	151.52	14.55*
26	.....	.....	169.52	14.40	.....	.....	166.08	14.56
		2)28.88		28.90		29.05		29.11
		2)14.44		14.45		14.525		14.555
		7.2200		7.225		7.2625		7.2775
		7.2250						
		7.2625						
		7.2775						
		4)28.9850						
		7.24625 Velocity with a Motive Weight of 60 lbs.						

† Query 126.22?

THURSDAY, November 8, 1798.

New Conductor, broad bar, and Friction Plank, &c.

Thermometer in the Air, 54°;—In the Dock, 59°.—Water in the Dock, 13 feet.—Wind, S. W. Moderate.

System Four-fold.

Total Weight 245 lbs. Motive Weight 60 lbs.						
Accel. Wt. Chain	ft. 13	in. 6	A. Wt. Chain	ft. 13	in. 6	A. Wt. Chain ft. 13 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.40	4.40	5.25	5.25	3.30	3.30
4	12.68	8.28	14.20	8.95	10.95	7.65
6	24.05	11.37	26.05	11.85	21.70	10.75
8	37.25	13.20	39.52	13.47	34.32	12.62
10	51.40	14.15	53.52	14.00	48.30	13.98
12	65.85	14.45	68.10	14.58	62.45	14.15
14	80.65	14.80	82.60	14.50	77.10	14.65
16	95.30	14.65	97.20	14.60	91.70	14.60
18	110.10	14.80	111.72	14.52*	106.58	14.88
20	124.90	14.80*	126.32	14.60	121.24	14.66
22	139.35	14.45	140.84	14.52	135.95	14.71*
24	154.05	14.70	.....	.....	150.65	14.70
26	.....	.....	.....	.....	165.35	14.70
		3)43.95		43.64		44.11
		2)14.65		14.5466		14.7033
		7.3250		7.2733		7.3516
		7.2733				
		7.3516				
		7.2200				
		7.2250				
		7.2625				
		7 2775				
		7)50.9349				
		7.2764 Velocity with a Motive Weight of 60 lbs.				

THURSDAY, November 8, 1798.

New Conductor, broad bar, and Friction Plank, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15		A. Wt. Chain ft. 8 in. 6		A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.80	4.80	4.72	4.72	4.00	4.00	8.75	8.75
4	14.00	9.20	13.72	9.00	11.95	7.95	20.75	12.00
6	26.25	12.25	26.15	12.43	23.08	11.13	34.62	13.87
8	40.45	14.20	40.50	14.35	35.95	12.87	49.22	14.60
10	55.52	15.07	55.65	15.15	50.25	14.30	64.40	15.18
12	71.12	15.60	71.15	15.50	65.05	14.80	79.90	15.50
14	86.80	15.68	86.90	15.75	80.35	15.50†	95.72	15.82
16	102.72	15.92	102.68	15.78	96.00	15.65	111.80	16.08
18	118.82	16.60	118.62	15.94	112.00	16.00	127.88	16.08
20	135.03	16.21	134.84	16.22	128.12	16.12	144.15	16.27*
22	151.20	16.17*	150.95	16.11*	144.25	16.13*	160.30	16.15
24	167.40	16.20	167.22	16.27	160.35	16.10	.....	.....
		2)32.37		32.38		32.23		32.42
		2)16.185		16.19		16.115		16.21
		8.0925		8.095		8.0575		8.105
		8.0950						
		8.0575						
		8.1050						
		4)32.3500						
		8.0875 Velocity with a Motive Weight of 72 lbs.						

† Query 15.30?

N. B. The last two sets of experiments were made on November the 6th.

THURSDAY, November 8, 1798.

New Conductor, broad bar, and Friction Plank, &c.

System Four-fold.

Total Weight 394 lbs.			Motive Wt. 96 lbs.	
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.40	5.40	5.60	5.60
4	16.15	10.75	16.78	11.18
6	30.95	14.80	31.45	14.67
8	47.55	16.60	48.30	16.85
10	65.25	17.70	65.80	17.50
12	83.22	17.97	83.80	18.00
14	101.32	18.10	101.92	18.12
16	119.90	18.58	120.32	18.40
18	138.35	18.45*	138.80	18.48*
20	156.90	18.55	157.30	18.50
		2)37.00		36.98
		2)18.50		18.49
		9.250		9.245
		9.245		
		2)18.4950		
		9.2475	Velocity with a Motive Weight of 96 lbs. per this day's experiment.	

TUESDAY, November 6, 1798.

New Conductor, broad bar, and Friction Plank, &c.

Thermometer in the Air, 46°;—In the Dock, 49°.—Water in the Dock, 12 ft. 6 in.—Wind, W.N.W. Moderate.

System Four-fold.

Total Weight 394 lbs.			Motive Weight 96 lbs.			
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.		A. Wt. Chain 12 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.60	4.60	5.40	5.40	4.90	4.90
4	14.40	9.80	14.25	8.85	15.25	10.35
6	28.35	13.95	30.45	16.20	29.35	14.10
8	44.60	16.25	46.65	16.20	45.50	16.15
10	61.75	17.15	63.95	17.30	62.80	17.30
12	79.48	17.73	81.65	17.70	80.60	17.80
14	97.62	18.14	99.87	18.22	98.75	18.15
16	116.05	18.43	118.20	18.33	117.15	18.40
18	134.65	18.60*	136.76	18.56*	135.50	18.35*
20	153.00	18.35	155.22	18.46	154.08	18.58
		2)36.95		37.02		36.93
		2)18.475		18.51		18.465
		9.2375		9.255		9.2325
		9.2550				9.2550
		9.2325				9.2375
		9.2500				
		9.2450				3)27.7250
		5)46.2200				9.2416 M. Wt. of 96 lbs. per this day's experiment.
		9.2440 Velocity with a Motive Weight of 96 lbs.				

TUESDAY, November 6, 1798.

New Conductor, broad bar, and Friction Plank, &c.

System Four-fold.

Total Weight 489 lbs. Motive Weight 120 lbs.								
Accel. Wt. Chain ft. 12		A. Wt. Chain ft. 12		A. Wt. Chain ft. 12		A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.35	5.35	8.70	8.70	8.85	8.85	7.95	7.95
4	17.15	11.80	22.55	13.85	22.95	14.10	21.25	13.30
6	32.88	15.73	39.90	17.35	40.30	17.35	38.40	17.05
8	51.30	18.42	58.65	18.75	59.20	18.90	57.05	18.65
10	70.55	19.25	78.15	19.50	78.70	19.50	76.85	19.80
12	90.58	20.03	98.12	19.97	98.93	20.23	96.88	20.03
14	110.85	20.27	118.46	20.34	119.12	20.19	117.10	20.22
16	131.30	20.45*	138.76	20.30*	139.45	20.33*	137.42	20.32*
18	151.80	20.50	159.08	20.32	159.75	20.30	157.78	20.36
		2)40.95		40.62		40.63		40.68
		2)20.475		20.31		20.315		20.34
		10.2375		10.155		10.1575		10.17
		10.1550						
		10.1575						
		10.1700						
		4)40.7200						
		10.1800 Velocity with a Motive Wt. of 120 lbs. per this day's experiments.						

THURSDAY, November 8, 1798.

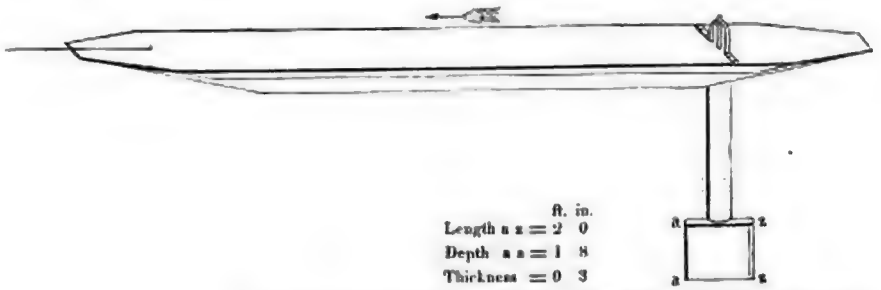
New Conductor, broad bar, and Friction Plank, &c.

System Four-fold.

Total Weight 489 lbs. Motive Weight 120 lbs.

Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15		A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.12	7.12	9.10	9.10	6.30	6.30
4	20.18	13.06	23.42	14.32	19.20	12.90
6	37.28	17.10	41.30	17.88	36.10	16.90
8	56.40	19.12	60.45	19.15	54.95	18.85
10	76.25	19.85	80.55	20.10	74.75	19.80
12	96.48	20.23	100.70	20.15	94.85	20.10
14	117.02	20.54	121.15	20.45	115.28	20.43
16	137.50	20.48*	141.50	20.35*	135.68	20.40*
18	157.92	20.42	162.00	20.50	156.10	20.42
		2)40.90		40.85		40.82
		2)20.45		20.425		20.41
		10.2250		10.2125		10.2050
		10.2125				10.2125
		10.2050				10.2250
		10.1700				3)30.6425
		10.1575				10.2142 M. Wt. of 120 lbs. per this day's experiments.
		10.1550				
		10.2375				
		7)71.3625				
		10.1946 Velocity with a Motive Weight of 120 lbs.				

New Conductor, broad bar, and Short Friction Plank, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.6897	5.2083	6.2700	7.0666	7.8458	8.5283	9.7133	10.9292
Correction for Line	3.7085	5.2298	6.3082	7.1097	7.8937	8.5991	9.7939	11.020
Hutt. Correction, or Regular Series	3.7039	5.1217	6.1911	7.0825	7.8615	8.5612	9.7939	10.871

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.7300	3.2126	7.6460	14.146	22.797	33.666	46.812	62.282	80.124	100.37	123.07	148.24	191.51

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.																
12 and	24	2.0164															
	36	2.0680	24..36	2.1627													
	48	2.1301		48	2.2571	36..48	2.4052										
	60	2.1305		60	2.2256		60	2.2783	48..60	2.1332							
	72	2.1305		72	2.2092		72	2.2373		72	2.1318	60..72	2.1301				
	96	2.1412		96	2.2096		96	2.2296		96	2.1641		96	2.1790	72..96	1.7564	
	120	2.1142		120	2.1593		120	2.1582		120	2.0908		120	2.0775		120	2.0593	96..120	1.8918

28)59.8770

Mean 12 lbs. and 96 lbs. . 2.1385

SATURDAY, November 10, 1798.

New Conductor, broad bar, and Short Friction Plank, immersed six feet.

Thermometer in the Air, 48°;—In the Dock, 48°.—Water in the Dock, 12 ft. 9 in.—Wind, N.W. Moderate.

System Four-fold.

Total Weight 52 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain 14 ft. 6 in.			A. Wt. Chain 12 ft.		A. Wt. Chain 10 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.40	6.40	4.15	4.15	6.06	6.06
8	20.32	13.92	15.80	11.65	18.15	12.09
12	37.90	17.58	31.30	15.50	32.90	14.75
16	55.90	18.00	47.71	16.41	48.05	15.15
20	72.75	16.85	63.64	15.93	63.00	14.95
24	88.65	15.90	78.82	15.18	77.50	14.50
28	103.82	15.17	93.80	14.98	91.89	14.39
32	118.80	14.98	108.45	14.65	106.30	14.41
36	133.60	14.80	123.11	14.66	120.75	14.45
38	140.90	7.30	130.39	7.28	127.95	7.20
40	148.22	7.32	137.71	7.32	135.20	7.25
42	155.62	7.40*	144.94	7.23	142.53	7.33
44	162.90	7.28	152.30	7.36	149.70	7.17
46	170.25	7.35	159.60	7.30*	157.15	7.45*
48	.....	.....	167.00	7.40	164.40	7.25
50	.....	.....	174.40	7.40	171.90	7.50
		3)22.03		22.10		22.20
		2)7.3433		7.3666		7.40
		3.6716		3.6833		3.70

SATURDAY, November 10, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

System Four-fold.

Total Weight 52 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10		A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.87	4.87	8.84	8.84	8.69	8.69
8	16.23	11.36	22.60	13.76	22.15	13.46
12	30.80	14.57	38.00	15.40	37.52	15.37
16	45.90	15.10	53.30	15.30	52.80	15.28
20	60.85	14.95	68.15	14.85	67.60	14.80
24	75.50	14.65	82.74	14.59	82.23	14.63
28	89.98	14.48	97.25	14.51	96.79	14.56
32	104.43	14.45	111.70	14.45	111.15	14.36
36	119.05	14.62	126.25	14.55	125.74	14.59
38	126.30	7.25	133.50	7.25	132.97	7.23
40	133.70	7.40	140.80	7.30	140.30	7.33
42	141.05	7.35	148.10	7.30	147.69	7.39
44	148.40	7.35	155.40	7.30*	155.05	7.36*
46	155.75	7.35*	162.85	7.45	162.42	7.37
48	163.20	7.45	170.15	7.30	169.83	7.41
50	170.71	7.51	.....	.....	.....	.....
		3)22.31		22.05		22.14
		2)7.4366		7.35		7.38
		7.7183		3.6750		3.69
				3.7183		
				3.6900		
				3.7000		
				3.6833		
				3.6716		
				6)22.1382		
				3.6897 Velocity with a Motive Weight of 12 lbs.		

FRIDAY, November 9, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

Thermometer in the Air, 49°;—In the Dock, 49°.—Water in the Dock, 13 feet.—Wind, N. W. Moderate.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	10.10	10.10	8.90	8.90	8.05	8.05
8	28.15	18.05	26.15	17.25	25.05	17.00
12	48.80	20.65	47.00	20.85	45.55	20.50
16	69.55	20.75	67.80	20.80	66.60	21.05
20	89.82	20.27	88.30	20.50	87.12	20.52
24	110.08	20.26	108.75	20.45	107.65	20.53
26	120.30	10.22	119.00	10.25	117.80	10.15
28	130.45	10.15	129.22	10.22	128.10	10.30
30	140.62	10.17	139.55	10.33	138.40	10.30
32	150.88	10.26	149.85	10.30	148.82	10.42
34	161.20	10.32*	160.30	10.45*	159.28	10.46*
36	171.50	10.30	170.75	10.45	169.80	10.52
		2)20.62		20.90		20.98
		2)10.31		10.45		10.49
		5.155		5.225		5.245
		5.225				
		5.245				
		3)15.6250				
		5.2083 Velocity with a Motive Weight of 24 lbs.				

FRIDAY, November 9, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

System Four-fold.

Total Weight 146 lbs. Motive Wt. 36 lbs.						
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	10.55	10.55	12.10	12.10	9.50	9.50
8	23.75	13.20	33.68	21.58	29.65	20.15
12	43.90	20.15	58.00	24.32	53.62	23.97
16	68.55	24.65	82.58	24.58	78.10	24.48
20	93.15	24.60	94.92	12.34	102.75	24.65
22	105.50	12.35	107.30	12.38	115.25	12.50
24	117.88	12.38	119.80	12.50	127.65	12.40
26	130.30	12.42	132.12	12.32	140.15	12.50*
28	142.80	12.50*	144.70	12.58*	152.68	12.53
30	155.32	12.52	157.22	12.52	165.25	12.57
32	167.88	12.56	169.80	12.58	.....	.....
		3)37.58		37.68		37.60
		2)12.5266		12.56		12.5333
		6.2633		6.28		6.2666
		6.2800				
		6.2666				
		3)18.8100				
		6.2700 Velocity with a Motive Weight of 36 lbs.				

FRIDAY, November 9, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

System Four-fold.

Total Weight 196 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15		A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.65	6.65	3.55	3.55	4.05	4.05
4	16.82	10.17	11.30	5.75†	12.40	8.35
6	29.30	12.48	12.25‡	10.95	23.80	11.40
8	42.75	13.45	35.00	12.75	36.72	12.92
10	56.40	13.65	48.65	13.65	50.28	13.56
12	70.45	14.05	62.60	13.95	64.00	13.72
14	84.15	13.70	76.50	13.90	77.92	13.92
16	98.20	14.05	90.32	13.82	91.72	13.80
18	112.20	14.00	104.45	14.13	105.75	14.03
20	126.35	14.15	118.45	14.00	119.75	14.00
22	140.56	14.21*	132.52	14.07*	133.82	14.07*
24	154.56	14.00	146.70	14.18	148.00	14.18
26	168.67	14.11	160.88	14.18	162.20	14.20
		3)42.32		42.43		42.45
		2)14.1066		14.1433		14.15
		7.0533		7.0716		7.075
		7.0716				
		7.0750				
		3)21.2000				
		7.0666 Velocity with a Motive Weight of 48 lbs.				

† Query 7.75?

‡ Query 22.25?

FRIDAY, November 9, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

System Four-fold.

Total Weight 245 lbs. Motive Weight 60 lbs.						
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15		A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.20	6.20	5.50	5.50	4.90	4.90
4	16.50	10.30	15.45	9.95	14.35	9.45
6	29.52	13.02	28.55	13.10	26.95	12.60
8	44.15	14.63	43.10	14.55	41.60	14.65
10	59.25	15.10	58.15	15.05	56.60	15.00
12	74.56	15.31	73.62	15.47	71.95	15.35
14	89.80	15.24	89.02	15.40	87.35	15.40
16	105.30	15.50	104.63	15.61	102.80	15.45
18	120.90	15.60	120.35	15.72	118.55	15.75
20	136.45	15.55	136.10	15.75	134.10	15.55
22	152.05	15.60*	151.82	15.72*	149.85	15.75*
24	167.65	15.60	167.60	15.78	165.55	15.70
		2)31.20		31.50		31.45
		2)15.60		15.75		15.725
		7.8000		7.875		7.8625
		7.8750				
		7.8625				
		3)23.5375				
		7.8458 Velocity with a Motive Weight of 60 lbs.				

SATURDAY, November 10, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

System Four-fold.

Toal Weight 394 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain 14 ft.			A. Wt. Chain 14 ft.		A. Wt. Chain 14 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.90	6.90	7.25	7.25	7.52	7.52
4	19.85	12.95	20.35	13.10	20.72	13.20
6	36.42	16.57	36.65	16.30	37.30	17.68†
8	54.55	18.13	54.70	18.05	55.15	17.85
10	73.20	18.65	73.15	18.45	73.62	18.47
12	92.25	19.05	92.38	19.23	92.60	18.98
14	111.72	19.47	111.65	19.27	111.88	19.28
16	131.32	19.60	131.15	19.50	131.25	19.37
18	150.70	19.38*	150.68	19.53*	150.72	19.47*
20	170.18	19.48	170.00	19.32	170.10	19.38
		2)38.86		38.85		38.85
		2)19.43		19.425		19.425
		9.7150		9.7125		9.7125
		9.7125				
		9.7125				
		3)29.1400				
		9.7133 Velocity with a Motive Weight of 96 lbs.				

† Query 16.58?

SATURDAY, November 10, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

System Four-fold.

Total Weight 295 lbs. Motive Weight 72 lbs.				
Accel. Wt. Chain ft. 14			A. Wt. Chain ft. 14	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.60	7.60	6.50	6.50
4	19.40	11.80	17.40	10.90
6	34.05	14.65	31.35	13.95
8	49.80	15.75	47.00	15.65
10	65.80	16.00	63.10	16.10
12	82.20	16.40	79.45	16.35
14	98.68	16.48	96.00	16.55
16	115.60	16.92	112.88	16.88
18	132.66	17.06*	129.93	17.05*
20	149.65	16.99	147.00	17.07
22	166.70	17.05	164.12	17.12
		3)51.10		51.24
		2)17.0333		17.08
		8.5166		8.54
		8.5400		
		2)17.0566		
		8.5283 Velocity with a Motive Weight of 72 lbs.		

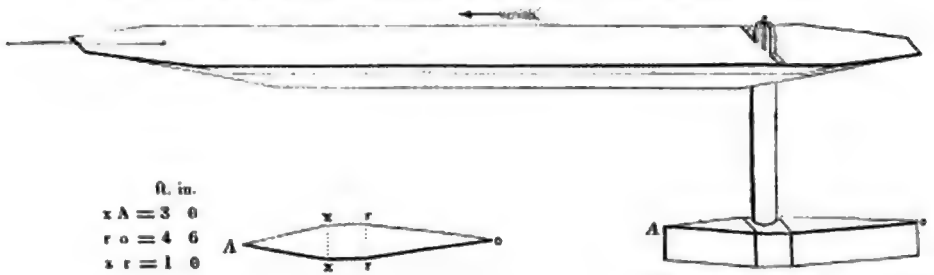
SATURDAY, November 10, 1798.

New Conductor, broad bar, and Short Friction Plank, &c.

System Four-fold.

Total Weight 489 lbs. Motive Weight 120 lbs.						
Accel. Wt. Chain ft. 10 in. 6			A. Wt. Chain ft. 10 in. 6		A. Wt. Chain ft. 10 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.10	5.10	6.75	6.75	5.70	5.70
4	17.60	12.50	20.70	13.95	18.65	12.95
6	34.75	17.15	38.30	17.60	36.15	17.50
8	54.10	19.35	58.20	19.90	55.85	19.70
10	75.00	20.90	79.05	20.85	76.58	20.73
12	95.95	20.95	100.56	21.51	97.92	21.34
14	117.70	21.75	122.32	21.76	119.80	21.88
16	139.30	21.60*	144.28	21.96*	141.75	21.95*
18	161.15	21.85	166.12	21.84	163.70	21.95
		2)43.45		43.80		43.90
		2)21.725		21.90		21.95
		10.8625		10.95		10.975
		10.9500				
		10.9750				
		3)32.7875				
		10.9292 Velocity with a Motive Weight of 120 lbs.				

New Conductor, broad bar, and body A o, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.8089	5.3483	.....	7.3083	.....	8.6858	9.9275	.....
Correction for Line	3.8283	5.3756	.....	7.3529	.....	8.7579	10.0099	.....
Hutt. Correction, or Regular Series	3.8292	5.2736	6.3594	7.2627	8.0508	8.7579	10.0020	11.088

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.6550	2.9394	7.0735	13.189	21.385	31.739	44.319	59.183	76.381	95.959	117.96	142.42	184.60
Conductor and Bar	0.3613	1.7778	4.5151	8.7473	14.609	22.215	31.662	43.038	56.423	71.884	89.493	109.31	143.97
Resistance and Friction of A o	0.2937	1.1616	2.5584	4.442	6.776	9.524	12.657	16.145	19.958	24.075	28.47	33.11	40.63
Friction of A o, 11.43 feet..	0.0425	0.1634	0.3583	0.625	0.963	1.371	1.846	2.389	2.999	3.675	4.41	5.22	6.58
Plus Pressure of A o, Minus Pressure being none ...	0.2512	0.9982	2.2001	3.817	5.813	8.153	10.811	13.756	16.959	20.400	24.06	27.89	34.05

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
12 and	24	2.0420							
	48	2.1241	24..48	2.2130					
	72	2.1652	72	2.2509	48..72	2.3188			
	96	2.1436	96	2.1983	96	2.1839	72..96	2.0185	

10)21.6583

Mean 12 lbs. and 72 lbs. 2.1658

Law of the Plus Press. A o|1.9905|1.9491|1.9152|1.8852|1.8555|1.8306|1.8042|1.7773|1.7534|1.7313|1.6977|1.6661|0.0295|—*

* Mean decrease.

THURSDAY, October 18, 1798.

New Conductor, broad bar, and body A o, immersed six feet.

Thermometer in the Air, 52½°;—In the Dock, 54°.—Water in the Dock, 12 feet 6 inches.—Calm.

System Four-fold.

Total Wt. 51 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.48	7.48	6.60	6.60	3.80	3.80
8	20.50	13.02	19.52	12.92	12.20†	11.40
12	36.42	15.92	35.35	15.83	30.68	15.48
16	52.90	16.48	52.00	16.65	47.12	16.44
20	68.90	16.00	68.28	16.28	63.60	16.48
24	84.38	15.48	83.88	15.60	79.28	15.68
28	99.38	15.00	99.30	15.42	94.72	15.44
32	114.60	15.22	114.45	15.15	109.90	15.18
36	129.75	15.15	129.90	15.45	125.05	15.15
38	137.20	7.45	137.40	7.50	132.62	7.57
40	144.72	7.52	145.05	7.65	140.24	7.62
42	152.35	7.63	152.70	7.65	147.71	7.47
44	159.85	7.50*	160.42	7.72*	155.30	7.59
46	167.45	7.60	168.10	7.68	162.85	7.55*
48	175.08	7.63	175.80	7.70	170.50	7.65
50	.....	.....	.....	.....	178.03	7.53
		3)22.73		23.10		22.73
		2)7.5766		7.70		7.5766
		3.7883		3.85		3.7883
		3.8500				
		3.7883				
		3)11.4266				
		3.8089 Velocity with a Motive Weight of 12 lbs.				

† Query 15.20?

THURSDAY, October 18, 1798.

New Conductor, broad bar, and body A o, &c.

System Four-fold.

Total Wt. 97 lbs. 12 oz.	Motive Wt. 24 lbs.
Accel. Wt. Chain ft. 12	A. Wt. Chain ft. 12

Sec.	Feet.	Differences.	Feet.	Differences.
4	6.14	6.14	12.30	12.30
8	20.90	14.76	30.50	18.20
12	39.83	18.93	50.65	20.15
16	60.20	20.37	71.35	20.70
20	80.90	20.70	92.09	20.74
24	101.80	20.90	113.00	20.91
28	129.70	20.90	123.65	10.65
30	133.55	10.85	134.25	10.60
32	144.20	10.65*	145.00	10.75*
34	154.90	10.70	155.70	10.70
36	165.55	10.65	166.43	10.73
		3)32.00		32.18
		2)10.6666		10.7266
		5.3333		5.3633
		5.3633		
		2)10.6966		
		5.3483 Velocity with a Motive Wt. of 24 lbs.		

System Four-fold.

Total Wt. 195 lbs.	Motive Wt. 48 lbs.
Accel. Wt. Chain ft. 12	A. Wt. Chain ft. 12

Sec.	Feet.	Differences.	Feet.	Differences.
2	7.00	7.00	4.95	4.95
4	16.80	9.80	13.50	8.55
6	28.45	11.65	24.32	10.82
8	41.40	12 95	36.69	12.37
10	54.94	13.54	49.85	13.16
12	68.70	13.76	63.80	13.95
14	82.84	14.14	77.80	14.00
16	97.29	14.45	91.94	14.14
18	111.65	14.36	106.50	14.56
20	126.30	14.65*	120.95	14.45
22	141.03	14.73	135.63	14.68*
24	155.60	14.57	150.20	14.57
26	.....	.....	164.70	14.50
		3)43.95		43.75
		2)14.65		14.5833
		7.3250		7.2916
		7.2916		
		2)14.6166		
		7.3083 Velocity with a Motive Weight of 48 lbs.†		

† These experiments were made with the smaller line.

THURSDAY, October 18, 1798.

New Conductor, broad bar, and body A o, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain 13 ft.			A. Wt. Chain 15 ft.		A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.50	5.50	4.70	4.70	5.50	5.50
4	15.70	10.20	14.20	9.50	15.75	10.25
6	29.18	13.48	27.60	13.40	29.80	14.05
8	44.35	15.17	42.98	15.38	45.45	15.65
10	60.10	15.75	59.40	16.42	61.90	15.45
12	76.72	16.62	75.98	16.58	78.68	16.78
14	93.32	16.60	92.95	16.97	95.78	17.10
16	110.25	16.93	110.00	17.05	112.78	17.00
18	127.45	17.20	127.35	17.35	130.05	17.27
20	144.79	17.34*	144.70	17.35*	147.55	17.50*
22	162.18	17.39	162.00	17.30	164.90	17.35
		2)34.73		34.65		34.85
		2)17.365		17.325		17.425
		8.6825		8.6625		8.7125
		8.6625				
		8.7125				
		3)26.0575				
		8.6858 Velocity with a Motive Weight of 72 lbs.				

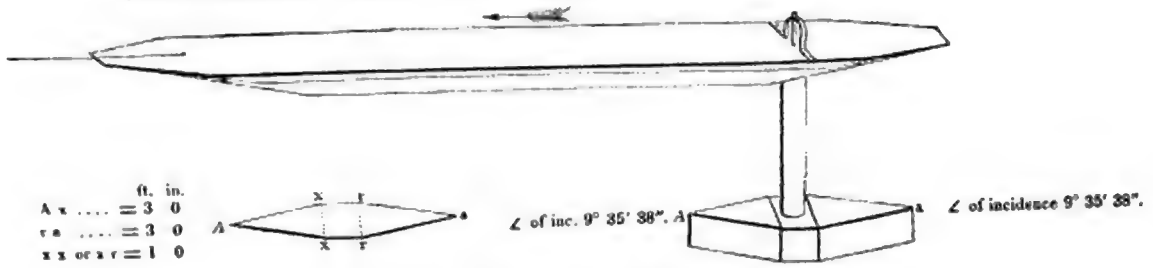
THURSDAY, October 18, 1798.

New Conductor, broad bar, and body A o, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15		A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.12	4.12	5.20	5.20	6.10	6.10
4	14.40	10.28	14.30	9.10	17.50	11.40
6	29.60	15.20	32.20	17.90	33.45	15.95
8	47.05	17.45	50.10	17.90	51.55	18.10
10	65.95	18.90	68.88	18.78	70.30	18.75
12	85.10	19.15	88.15	19.27	89.65	19.35
14	104.51	19.41	107.85	19.70	109.30	19.65
16	124.32	19.81	127.70	19.85*	129.20	19.90
18	144.16	19.84*	147.60	19.90	149.12	19.92*
20	164.00	19.84	.....	.....	168.90	19.78
		2)39.68		39.75		39.70
		2)19.84		19.875		19.85
		9.9200		9.9375		9.925
		9.9375				
		9.9250				
		3)29.7825				
		9.9275 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body A a, immersed six feet.



	Motive Weights.					
	12	24	36	48	72	96
Velocity per Experiment.....	3.8008	5.3522	6.4191	7.2800	8.6977	9.9437
Correction for Line	3.8202	5.3795	6.4583	7.3244	8.7699	10.0266
Hutt. Correction, or Regular Series	3.8834	5.3277	6.4099	7.3088	8.7935	10.0266

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.6130	2.8015	6.8147	12.803	20.882	31.145	43.666	58.517	75.759	95.443	117.62	142.34	185.07
Conductor and Bar.....	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction	0.2517	1.0237	2.2996	4.056	6.273	8.930	12.004	15.479	19.336	23.559	28.13	33.03	41.10
Friction on 9.916 feet	0.0368	0.1417	0.3109	0.542	0.836	1.189	1.602	2.073	2.602	3.188	3.83	4.53	5.70
Plus and Minus Pressures...	0.2149	0.8820	1.9887	3.514	5.437	7.741	10.402	13.406	16.734	20.371	24.30	28.50	35.40
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.056	16.284	19.815	23.61	27.68	34.34

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
12 and 24	2.0251												
36	2.0294	24..36	2.2183										
48	2.1298	48	2.2460	36..48	2.2860								
72	2.1561	72	2.2479	72	2.2656	48..72	2.2511						
96	2.1601	96	2.2345	96	2.2425	96	2.2073	72..96	2.1850				

15)32.8847

Mean 72 lbs. and 96 lbs. 2.1923

Law of Minus Press. of A a | 2.0297 | 2.0553 | 2.0781 | 2.0306 | 2.1812 | 2.1148 | 2.0553 | 2.1336 | 2.0076 | 2.2654 | 1.9839 | 2.1432 | 2.0899 | Mean

WEDNESDAY, October 24, 1798.

New Conductor, broad bar, and body A a, immersed six feet.

Thermometer in the Air, 53°;—In the Dock, 53½°.—Water in the Dock, 12 feet.—Wind, N.W. Light Airs.

System Four-fold.

Total Wt. 51 lbs.			M. Wt. 12 lbs.	
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 9	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.80	4.80	6.39	6.39
8	16.29	11.49	18.27	11.88
12	31.10	14.81	33.10	14.83
16	46.80	15.70	48.39	15.29
20	62.50	15.70	63.65	15.26
24	77.75	15.25	78.52	14.87
28	92.75	15.00	93.40	14.88
32	107.60	14.85	108.14	14.74
34	115.14	7.54	123.05	14.91
36	122.55	7.41	130.40	7.35
38	130.05	7.50	137.90	7.50
40	137.55	7.50	145.35	7.45
42	145.05	7.50	152.92	7.57
44	152.62	7.57	160.50	7.58*
46	160.24	7.62*	168.04	7.54
48	167.83	7.59	175.70	7.66
50	175.45	7.62	.....	.....
		3)22.83		22.78
		2)7.61		7.5933
		3.8050		3.7966
		3.7966		
		2)7.6016		
		3.8008	Velocity with a Motive Weight of 12 lbs.	

WEDNESDAY, October 24, 1798.

New Conductor, broad bar, and body A a, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	10.30	10.30	9.55	9.55	7.80	7.80
8	28.23	17.93	26.90	17.35	24.09	17.29†
12	49.35	21.12	47.80	20.90	44.61	20.52
16	70.84	21.49	69.19	21.39	66.10	21.49
20	92.08	21.24	90.42	21.23	87.40	21.30
22	102.64	10.56	100.95	10.53	108.53	21.13
24	113.21	10.57	111.51	10.56	119.11	10.58
26	123.90	10.69	122.20	10.69	129.80	10.69
28	134.53	10.63	132.80	10.60	140.45	10.65
30	145.20	10.67*	143.49	10.69*	151.15	10.70*
32	155.89	10.69	154.20	10.71	161.89	10.74
34	166.65	10.76	164.87	10.67	172.60	10.71
		3)32.12		32.07		32.15
		2)10.7066		10.69		10.7166
		5.3533		5.345		5.3583
		5.3450				
		5.3583				
		3)16.0566				
		5.3522 Velocity with a Motive Weight of 24 lbs.				

† Query 16.29?

WEDNESDAY, October 24, 1798.

New Conductor, broad bar, and body A a, &c.

System Four-fold.

Total Wt. 146 lbs.			Motive Wt. 36 lbs.	
Accel. Wt. Chain 14 ft.			Accel. Wt. Chain 14 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	11.15	11.15	12.39	12.39
8	32.50	21.35	34.15	21.76
12	57.30	24.80	59.27	25.12
16	82.70	25.40	84.75	25.48
20	108.25	25.55	97.45	12.70
22	121.11	12.86	110.25	12.80
24	133.89	12.78*	123.15	12.90
26	146.80	12.91	135.97	12.82*
28	159.60	12.80	148.82	12.85
30	.....	.....	161.69	12.87
		3)38.49		38.54
		2)12.83		12.8466
		6.4150		6.4233
		6.4233		
		2)12.8383		
		6.4191	Velocity with a Motive Weight of 36 lbs.	

WEDNESDAY, October 24, 1798.

New Conductor, broad bar, and body A a, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.

Accel. Wt. Chain ft. 14			A. Wt. Chain ft. 14		A. Wt. Chain ft. 14		A. Wt. Chain ft. 14	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.20	5.20	4.79	4.79	4.75	4.75	2.20	2.20
4	13.94	8.74	13.36	8.57	13.39	8.64	8.83	6.63
6	25.73	11.79	24.49	11.13	24.65	11.26	18.70	9.97
8	38.75	13.02	37.64	13.15	37.65	13.00	31.00	12.30
10	52.53	13.78	51.60	13.96	51.53	13.88	44.11	13.11
12	66.70	14.17	65.55	13.95	65.58	14.05	58.14	14.03
14	81.04	14.34	79.64	14.09	79.80	14.22	72.35	14.21
16	95.45	14.41	94.15	14.51	94.20	14.40	86.70	14.35
18	109.80	14.35	108.58	14.43	108.61	14.41	101.01	14.31
20	124.36	14.56*	123.12	14.54	123.20	14.59	115.60	14.59
22	138.90	14.54	137.69	14.57*	137.65	14.45*	130.08	14.48*
24	153.52	14.62	152.23	14.54	152.29	14.64	144.72	14.64
26	.....	.....	166.87	14.64	166.80	14.51	159.25	14.53
		3)43.72		43.75		43.60		43.65
		2)14.5733		14.5833		14.5333		14.55
		7.2867		7.2916		7.2666		7.275
		7.2916						
		7.2666						
		7.2750						
		4)29.1199						
		7.27999 Velocity with a Motive Weight of 48 lbs.						

WEDNESDAY, October 24, 1798.

New Conductor, broad bar, and body A a, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.40	6.40	4.82	4.82	5.52	5.52
4	17.55	11.15	14.60	9.78	15.90	10.38
6	31.55	14.00	28.20	13.60	29.85	13.95
8	47.55	16.00	43.70	15.50	45.55	15.70
10	64.00	16.45	60.15	16.45	62.12	16.57
12	80.90	16.90	76.87	16.72	79.00	16.88
14	97.92	17.02	94.03	17.16	96.10	17.10
16	115.05	17.13	111.05	17.02	113.48	17.38
18	132.46	17.41*	128.45	17.40*	130.72	17.24*
20	149.72	17.26	145.82	17.37	148.22	17.50
22	167.25	17.53	163.24	17.42	165.65	17.43
		3)52.20		52.19		52.17
		2)17.40		17.3966		17.39
		8.7000		8.6983		8.695
		8.6983				
		8.6950				
		3)26.0933				
		8.6977 Velocity with a Motive Weight of 72 lbs.				

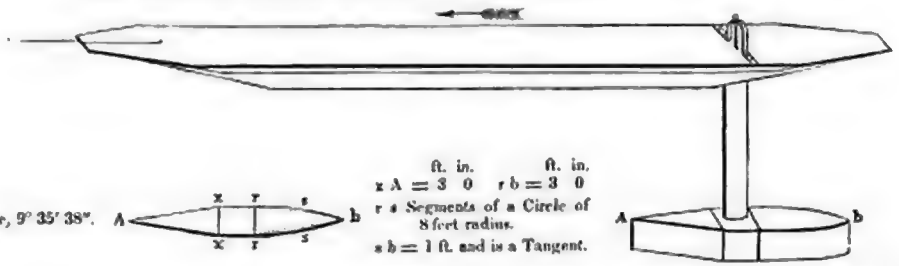
WEDNESDAY, October 24, 1798.

New Conductor, broad bar, and body A a, &c.

System Four-fold.

Total Wt. 394 lbs.			M. Wt. 96 lbs.	
Accel. Wt. Chain	ft. 14	in. 6	A. Wt. Chain	ft. 14 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.70	2.70	6.80	6.80
4	12.50	9.80	19.35	12.55
6	27.10	14.60	35.70	16.35
8	44.66	17.56	54.00	18.30
10	63.32	18.66	73.10	19.10
12	82.52	19.20	92.53	19.43
14	102.15	19.63	112.30	19.77
16	122.00	19.85	132.20	19.90*
18	141.80	19.80*	152.10	19.90
20	161.75	19.95	.....	.....
		2)39.75		39.80
		2)19.875		19.90
		9.9375		9.95
		9.9500		
		2)19.8875		
		9.9437	Velocity with a Motive Weight of 96 lbs.	

New Conductor, broad bar, and body A b, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.8912	5.3866	.....	7.2625	.....	8.7412	9.9562	.....
Correction for Line	3.9110	5.4141	.....	7.3068	.....	8.8137	10.0388	.....
Hutt. Correction, or Regular Series	3.9223	5.3653	6.4443	7.3391	8.1177	8.8149	10.0388	11.104

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.5832	2.7036	6.6311	12.532	20.534	30.736	43.230	58.092	75.390	95.181	117.53	142.48	185.72
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction. ..	0.2219	0.9258	2.1160	3.785	5.925	8.521	11.568	15.054	18.967	23.297	28.04	33.17	41.75
Friction on 10.8 feet.....	0.0401	0.1543	0.3386	0.590	0.910	1.295	1.745	2.258	2.834	3.472	4.17	4.93	6.21
Plus and Minus Pressures..	0.1818	0.7715	1.7774	3.195	5.015	7.226	9.823	12.796	16.133	19.825	23.87	28.24	35.54
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure.....	0.1770	0.7519	1.7323	3.113	4.886	7.034	9.557	12.446	15.683	19.269	23.18	27.42	34.48

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.										
12 and	24	2.1313									
	48	2.2180	24..48	2.3120							
	72	2.2052	72	2.2545	48..72	2.1624					
	96	2.2060	96	2.2454	96	2.1822	72..96	2.2104			
								10)22.1274			
								Mean 72 lbs. and 96 lbs.	2.2127		

Law of Minus Press. A b|2.0868|2.0586|2.0371|2.0201|1.9986|1.9884|1.9781|1.9628|1.9545|1.9388|1.9306|1.9127|0.0158|=*

* Mean decrease.

TUESDAY, November 20, 1798.

New Conductor, broad bar, and body A b, immersed six feet.

Thermometer in the Air, 42°.—Water in the Dock, 12 feet 3 inches.

System Four-fold.

Total Wt. 52 lbs.			Motive Wt. 12 lbs.	
Accel. Wt. Chain	ft. 10	in. 6	A. Wt. Chain	ft. 10 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
4	6.35	6.35	5.43	5.43
8	18.90	12.55	17.20	11.77
12	34.39	15.49	32.30	15.10
16	50.65	16.26	48.45	16.15
20	66.70	16.05	64.58	16.13
24	82.32	15.62	80.25	15.67
28	97.73	15.41	95.62	15.37
32	113.10	15.37	110.99	15.37
36	128.29	15.19	126.45	15.46
38	136.09	7.80	134.19	7.74
40	143.73	7.64	141.90	7.71
42	151.43	7.70	149.60	7.70
44	159.20	7.77	157.32	7.72
46	167.00	7.80*	165.12	7.80*
48	174.79	7.79	172.86	7.74
		2)15.59		15.54
		2)7.795		7.77
		3.8975		3.885
		3.8850		
		2)7.7825		
		3.8912	Velocity with a Motive Weight of 12 lbs.	

TUESDAY, November 20, 1798.

New Conductor, broad bar, and body A b, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 10 in. 6			A. Wt. Chain ft. 10 in. 6		A. Wt. Chain ft. 10 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.98	7.98	4.60	4.60	6.90	6.90
8	23.32	15.34	18.05	13.45	21.85	14.95
12	42.71	19.39	36.42	18.37	41.00	19.15
16	63.05	20.34	56.75	20.33	61.45	20.45
20	83.70	20.65	77.60	20.85	82.30	20.85
24	104.60	20.90	98.60	21.00	103.40	21.10
28	115.20	20.60	109.14	10.54	113.94	10.54
30	125.79	10.59	119.93	10.79	124.79	10.85
32	136.39	10.60	130.65	10.72	135.55	10.76
34	147.02	10.63*	141.40	10.75	146.35	10.80*
36	157.75	10.73	152.20	10.80*	157.19	10.84
38	168.45	10.70	163.04	10.84	168.05	10.86
40	.....	.....	173.80	10.76	.....	.....
		3)32.06		32.40		32.50
		2)10.6866		10.80		10.8333
		5.3434		5.40		5.4166
		5.4000				
		5.4166				
		3)16.1600				
		5.3866 Velocity with a Motive Weight of 24 lbs.				

TUESDAY, November 20, 1798.

New Conductor, broad bar, and body **A b**, &c.

System Four-fold.

Total Wt. 195 lbs. Motive Wt. 48 lbs.				
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.79	4.79	3.15	3.15
4	11.45	6.66	9.85	6.70
6	21.63	10.18	19.57	9.72
8	34.00	12.37	31.15	11.58
10	47.11	13.11	44.15	13.00
12	60.79	13.68	57.70	13.55
14	74.70	13.91	71.63	13.93
16	89.09	14.39	85.65	14.02
18	103.42	14.33	100.00	14.35
20	118.00	14.58	114.45	14.45
22	132.45	14.45	128.90	14.45
24	147.00	14.55	143.40	14.50
26	161.55	14.55*	157.90	14.50*
		2)14.55		14.50
		7.275		7.25
		7.250		
		2)14.525		
		7.2625 Velocity with a Motive Wt. of 48 lbs.		

System Four-fold.

Total Weight 296 lbs. Motive Wt. 72 lbs.				
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.55	6.55	2.20	2.20
4	17.19	10.64	10.20	8.00
6	31.10	13.91	22.24	12.04
8	46.80	15.70	37.09	14.85
10	63.45	16.65	53.27	16.18
12	80.25	16.80	69.95	16.68
14	97.31	17.06	86.83	16.88
16	114.17	17.39	104.00	17.17
18	132.05	17.35	121.25	17.25
20	149.60	17.55*	138.65	17.40*
22	167.00	17.40	156.23	17.58
		2)34.95		34.98
		2)17.475		17.49
		8.7375		8.745
		8.7450		
		2)17.4825		
		8.7412 Velocity with a Motive Wt. of 72 lbs.		

WEDNESDAY, November 21, 1798.

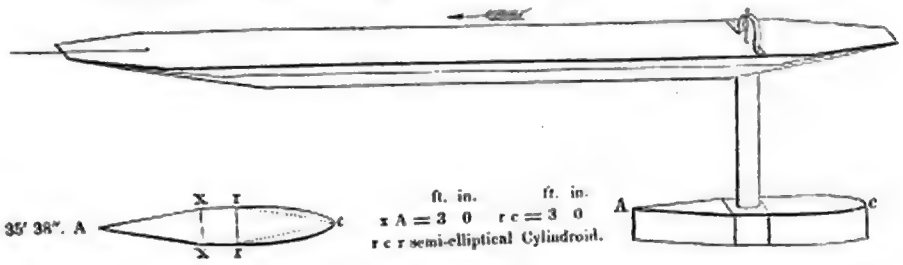
New Conductor, broad bar, and body A b, &c.

Thermometer in the Air, 36°;—In the Dock, 40¼°.—Water in the Dock, 12 feet.—Wind, East. Strong Breeze.

System Four-fold.

Total Weight 395 lbs.			Motive Wt. 96 lbs.	
Accel. Wt. Chain	ft. 13	in. 6	A. Wt. Chain	ft. 13 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.40	5.40	5.75	5.75
4	17.73	12.33	17.40	11.65
6	32.19	14.46	33.00	15.60
8	49.95	17.76	50.82	17.82
10	68.84	18.89	69.94	19.12
12	88.15	19.31	89.22	19.28
14	107.94	19.79	109.10	19.88
16	127.89	19.95	129.02	19.92
18	147.80	19.91*	148.95	19.93*
20	167.71	19.91	168.85	19.90
		2)39.82		39.83
		2)19.91		19.915
		9.9550		9.9575
		9.9575		
		2)19.9125		
		9.9562	Velocity with a Motive Weight of 96 lbs.	

New Conductor, broad bar, and body A e, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.6550	5.1691	.....	7.0816	.....	8.6375	9.8137	.....
Correction for Line	3.6636	5.1955	.....	7.1248	.....	8.7092	9.8951	.....
Hutt. Correction, or Regular Series	3.6937	5.1299	6.2167	7.1248	7.9194	8.6340	9.8951	10.999

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.7616	3.2882	7.7365	14.197	22.736	33.403	46.243	61.297	78.592	98.160	120.03	144.22	185.70
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction.....	0.4003	1.5104	3.2214	5.450	8.127	11.188	14.581	18.259	22.169	26.276	30.54	34.91	41.73
Friction on 11.605 feet.....	0.0431	0.1658	0.3638	0.634	0.978	1.392	1.875	2.426	3.045	3.731	4.48	5.30	6.68
Plus and Minus Pressures ..	0.3572	1.3446	2.8576	4.816	7.149	9.796	12.706	15.833	19.124	22.545	26.06	29.61	35.05
Plus Pressure A a.....	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.056	16.284	19.815	23.61	27.68	34.34
Minus Pressure.....	0.1471	0.4822	0.9140	1.384	1.841	2.247	2.570	2.777	2.840	2.730	2.45	1.93	0.71

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.										
12 and	24	1.9841									
	48	2.0842	24..48	2.1951							
	72	2.0713		72	2.1305	48..72	2.0284				
	96	2.0927		96	2.1518		96	2.1103	72..96	2.2536	

10)21.1022

Mean 48 lbs. and 96 lbs.. 2.1102

MONDAY, October 22, 1798.

New Conductor, broad bar, and body A c, immersed six feet.

Thermometer in the Air, 63°;—In the Dock, 54°.—Water in the Dock, 12 feet 6 inches.

System Four-fold.

Total Weight 51 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 9			A. Wt. Chain ft. 9		A. Wt. Chain ft. 9	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.63	7.63	6.38	6.38	6.50	6.50
8	20.15	11.52	18.49	12.11	18.30	11.80
12	34.95	14.80	33.00	14.51	32.85	14.55
16	50.17	15.22	48.33	15.33	48.21	15.36
20	64.40	14.23	63.44	15.11	63.29	15.08
24	79.63	15.23	78.30	14.86	78.10	14.81
28	93.98	14.35	92.90	14.60	92.75	14.65
32	108.05	14.07	107.39	14.49	107.27	14.52
36	122.63	14.58	121.87	14.48	121.80	14.53
38	129.70	7.07	129.10	7.23	129.03	7.23
40	136.90	7.20	136.40	7.30	136.30	7.27
42	144.32	7.42	143.65	7.25	143.49	7.19
44	151.60	7.28	150.89	7.24	150.70	7.21
46	158.80	7.20*	158.29	7.40*	157.95	7.25*
48	166.10	7.30	165.63	7.34	165.29	7.24
50	173.40	7.30	173.00	7.37	172.58	7.39
		3)21.80		22.11		21.88
		2)7.2666		7.37		7.2933
		3.6333		3.685		3.6466
		3.6850				
		3.6467				
		3)10.9650				
		3.6550 Velocity with a Motive Weight of 12 lbs.				

MONDAY, October 22, 1798.

New Conductor, broad bar, and body A e, &c.

System Four-fold.

Total Weight 97 lbs. 12 oz. Motive Weight 24 lbs.

Accel. Wt. Chain 10 ft.			A. W. Chain 10 ft.		A. Wt. Chain 10 ft.		A. Wt. Chain 10 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.00	8.00	10.65	10.65	6.25	6.25	6.70	6.70
8	23.64	15.64	27.39	16.74	20.89	14.64	21.85	15.15
12	42.63	18.99	46.47	19.08	39.50	18.61	40.75	18.90
16	62.35	19.72	66.35	19.88	59.23	19.73	60.53	19.78
20	82.21	19.86	86.52	20.17	79.09	19.86	80.62	20.09
24	102.21	20.00	106.90	20.38	99.24	20.15	100.85	20.23
26	112.30	10.09	117.23	10.33	109.30	10.06	111.05	10.20
28	122.60	10.30	127.50	10.27	119.45	10.15	121.30	10.25
30	132.74	10.14*	137.89	10.39*	129.74	10.29	131.60	10.30
32	143.10	10.36	148.25	10.36	140.00	10.26	142.04	10.44
34	153.60	10.50	158.65	10.40	150.30	10.30*	152.25	10.21*
36	.....	.....	.....	.....	160.58	10.28	162.70	10.45
38	.....	.....	.....	.....	170.95	10.37	173.00	10.30
		3)31.00		31.15		30.95		30.96
		2)10.3333		10.3833		10.3166		10.32
		5.1667		5.1916		5.1583		5.16
		5.1916						
		5.1583						
		5.1600						
		4)20.6766						
		5.1691 Velocity with a Motive Weight of 24 lbs.						

MONDAY, October 22, 1798.

New Conductor, broad bar, and body A c, &c.

System Four-fold.

Total Wt. 195 lbs. Motive Weight 48 lbs.				
Accel. Wt. Chain		ft. in. 11 6	A. Wt. Chain	ft. in. 11 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.70	2.70	2.90	2.90
4	9.30	6.60	9.79	6.89
6	18.98	9.68	19.58	9.79
8	30.45	11.47	31.30	11.72
10	42.95	12.50	43.79	12.49
12	56.05	13.10	56.93	13.14
14	69.40	13.35	70.45	13.52
16	83.11	13.71	84.15	13.70
18	96.93	13.82	98.03	13.88
20	110.90	13.97	112.05	14.02
22	124.90	14.00	126.25	14.20
24	139.05	14.15*	140.50	14.25*
26	153.06	14.01	154.65	14.15
28	167.30	14.24	168.83	14.18
		3) 42.40		42.58
		2) 14.1333		14.1933
		7.0666		7.0966
		7.0966		
		2) 14.1632		
		7.0816 Velocity with a Motive Weight of 48 lbs.		

SATURDAY, October 20, 1798.

New Conductor, broad bar, and body A c, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain 15 ft.			A. Wt. Chain 15 ft.		A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.06	5.06	6.52	6.52	3.50	3.50
4	14.99	9.93	17.49	10.97	10.48	6.98
6	28.26	13.27	31.80	14.31	22.66	12.18
8	43.53	15.27	47.52	15.72	37.52	14.86
10	59.59	16.06	64.03	16.51	53.58	16.06
12	76.08	16.49	80.70	16.67	70.10	16.52
14	92.91	16.83	97.76	17.06	86.93	16.83
16	109.80	16.89	114.87	17.11	103.87	16.94
18	126.90	17.10	132.11	17.24	120.94	17.07
20	144.00	17.10*	149.40	17.29*	138.26	17.32*
22	161.27	17.27	156.86	17.46	155.47	17.21
		2)34.37		34.75		34.53
		2)17.185		17.375		17.265
		8.5925		8.6875		8.6325
		8.6875				
		8.6325				
		3)25.9125				
		8.6375 Velocity with a Motive Weight of 72 lbs.				

SATURDAY, October 20, 1798.

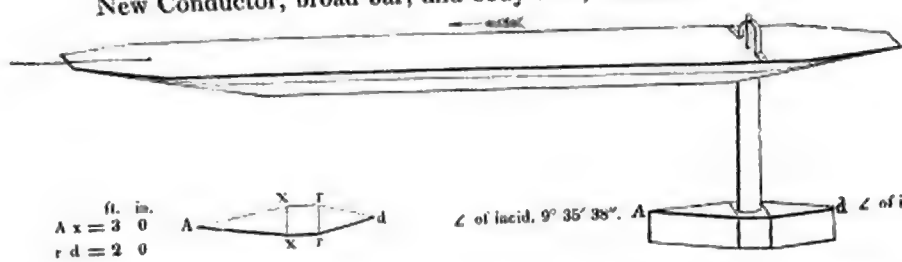
New Conductor, broad bar, and body A c, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.

Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.10	5.10	4.47	4.47	11.58	11.58	4.30	4.30
4	16.41	11.31	15.08	10.61	25.66	14.08	14.91	10.61
6	31.59	15.18	29.85	14.77	42.64	16.98	29.92	15.01
8	49.30	17.71	47.28	17.43	60.88	18.24	47.39	17.47
10	68.02	18.72	65.75	18.47	79.68	18.80	65.94	18.55
12	87.09	19.07	84.82	19.07	99.09	19.41	84.95	19.01
14	106.33	19.24	104.33	19.51	118.59	19.50	104.21	19.26
16	125.93	19.60	123.72	19.39	138.18	19.59*	123.91	19.70
18	145.61	19.68*	143.49	19.77*	157.88	19.70	143.33	19.42*
20	165.17	19.56	163.10	19.61	.....	.....	163.02	19.69
		2)39.24		39.38		39.29		39.11
		2)19.62		19.69		19.645		19.555
		9.8100		9.845		9.8225		9.7775
		9.8450						
		9.8225						
		9.7775						
		4)39.2550						
		9.81375 Velocity with a Motive Weight of 96 lbs.						

New Conductor, broad bar, and body A d, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.7625	5.2625	.....	7.1544	.....	8.6641	9.8533	.....
Correction for Line	3.7817	5.2893	.....	7.1980	.....	8.7360	9.9351	.....
Hutt. Correction, or Regular Series	3.7926	5.2248	6.3018	7.1980	7.9801	8.6817	9.9164	10.994

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.6709	3.0055	7.2259	13.466	21.822	32.374	45.189	60.325	77.833	97.759	120.15	145.04	187.94
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction	0.3096	1.2277	2.7108	4.719	7.213	10.159	13.527	17.287	21.410	25.875	30.66	35.73	43.97
Friction on 8.894 feet	0.0330	0.1271	0.2788	0.486	0.749	1.066	1.437	1.859	2.334	2.860	3.44	4.06	5.12
Plus and Minus Pressures..	0.2766	1.1006	2.4320	4.233	6.464	9.093	12.090	15.428	19.076	23.015	27.22	31.67	38.85
Plus Pressure A a	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.056	16.284	19.815	23.61	27.68	34.34
Minus Pressure	0.0665	0.2382	0.4884	0.801	1.156	1.544	1.954	2.372	2.792	3.200	3.61	3.99	4.51

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
12 and 24	2.0659	24..48	2.2497	48..72	2.0938	72..96	2.2367		
48	2.1539	72	2.1895	96	2.1508				
72	2.1424	96	2.1991						
96	2.1529								

10)21.6347

Mean 12 lbs. and 48 lbs. 2.1635

Law of Minus Press. A d|1.8407|1.7709|1.7197|1.6440|1.5874|1.5277|1.4518|1.3842|1.2945|1.2648|1.1503|1.0227|0.0744|=*

* Mean decrease.

WEDNESDAY, October 24, 1798.

New Conductor, broad bar, and body A d, immersed six feet.

Thermometer in the Air, 53°;—In the Dock, 53½°.—
Water in the Dock, 12 feet.—Wind, N.W. Light Airs.

System Four-fold.

Total Weight 51 lbs.			M. Weight 12 lbs.	
	Accel. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.25	5.25	5.63	5.63
8	16.37	11.12	16.90	11.27
12	30.70	14.33	31.34	14.44
16	46.09	15.39	46.40	15.06
20	61.40	15.31	61.62	15.22
24	76.33	14.93	76.41	14.79
28	91.10	14.77	91.10	14.69
32	105.75	14.65	105.72	14.62
36	120.50	14.75	120.39	14.67
38	127.90	7.40	127.80	7.41
40	135.35	7.45	135.19	7.39
42	142.77	7.42	142.60	7.41
44	150.20	7.43	150.08	7.48
46	157.73	7.53*	157.60	7.52*
48	165.21	7.48	165.11	7.51
50	172.74	7.53	172.69	7.58
		3)22.54		22.61
		2)7.5133		7.5366
		3.7566		3.7683
		3.7683		
		2)7.5249		
		3.7625 Velocity with a Motive Wt. of 12 lbs.		

System Four-fold.

Total Weight 98 lbs.			Motive Weight 24 lbs.	
	Accel. Wt. Chain 11 ft.		A. Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	10.20	10.20	7.20	7.20
8	27.40	17.20	23.00	15.80
12	47.60	20.20	42.80	19.80
16	68.50	20.90	63.55	20.75
20	89.30	20.80	84.22	20.67
24	110.10	20.80	104.90	20.68
26	120.50	10.40	115.30	20.40
28	131.05	10.55	125.73	10.43
30	141.60	10.55*	136.25	10.52
32	152.05	10.45	146.73	10.48*
34	162.63	10.58	157.30	10.57
36	.....	.....	167.82	10.52
		3)31.58		31.57
		2)10.5266		10.5233
		5.2633		5.2616
		5.2616		
		2)10.5250		
		5.2625 Velocity with a Motive Weight of 24 lbs.		

THURSDAY, October 25, 1798.

New Conductor, broad bar, and body A d, &c.

Thermometer in the Air, 50;—In the Dock, 52½°.—Water in the Dock, 12 feet.—Light Airs. Southerly.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 11 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.41	3.41	1.01	1.01	3.88	3.88
4	9.02	5.61	6.31	5.30	11.56	7.68
6	17.60	8.58	15.03	8.72	22.20	10.64
8	28.77	11.17	26.40	11.37	34.40	12.20
10	40.98	12.21	39.12	12.72	47.61	13.21
12	53.98	13.00	52.50	13.38	61.30	13.69
14	67.34	13.46	66.22	13.72	74.93	13.63
16	80.93	13.59	80.02	13.80	88.92	13.99
18	94.88	13.95	94.11	14.09	103.11	14.19
20	108.83	13.95	108.22	14.11	117.50	14.39
22	122.94	14.11	122.49	14.27	131.89	14.39*
24	137.07	14.13*	136.83	14.34*	146.37	14.48
26	151.36	14.29	151.10	14.27	160.79	14.42
28	165.52	14.16	165.40	14.30	.....	.....
		3)42.58		42.91		43.29
		2)14.1933		14.3033		14.43
		7.0967		7.1516		7.215
		7.1516				
		7.2150				
		3)21.4633				
		7.1544 Velocity with a Motive Weight of 48 lbs.				

THURSDAY, October 25, 1798.

New Conductor, broad bar, and body A d, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.70	5.70	3.22	3.22	6.30	6.30
4	16.09	10.39	11.97	8.75	16.70	10.40
6	29.70	13.61	24.47	12.50	30.27	13.57
8	44.99	15.29	39.30	14.83	45.53	15.26
10	60.97	15.98	55.11	15.81	61.70	16.17
12	77.50	16.53	71.59	16.48	78.20	16.50
14	94.30	16.80	88.27	16.68	95.13	16.93
16	111.46	17.16	105.29	17.02	112.27	17.14
18	128.74	17.28	122.60	17.31	129.39	17.12
20	146.07	17.33*	139.97	17.37*	146.75	17.36*
22	163.39	17.32	157.34	17.37	163.97	17.22
		2)34.65		34.74		34.58
		2)17.325		17.37		17.29
		8.6625		8.685		8.645
		8.6850				
		8.6450				
		3)25.9925				
		8.6641 Velocity with a Motive Weight of 72 lbs.				

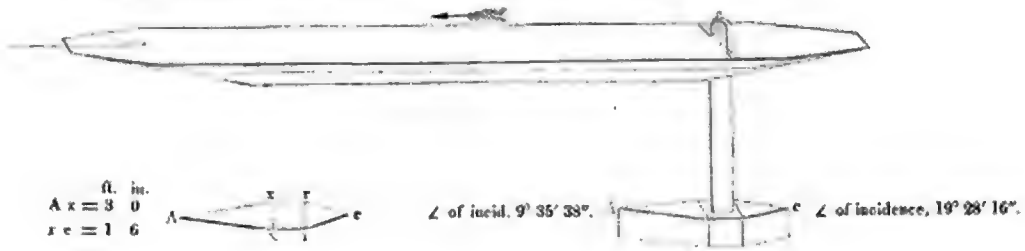
THURSDAY, October 25, 1798.

New Conductor, broad bar, and body A d, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.59	4.59	3.91	3.91	7.52	7.52
4	15.77	11.18	13.88	9.97	20.25	12.73
6	31.03	15.26	28.52	14.64	36.82	16.57
8	48.67	17.64	45.61	17.09	54.72	17.90
10	67.13	18.46	64.03	18.42	73.58	18.86
12	86.35	19.22	82.99	18.96	92.89	19.31
14	105.84	19.49	102.39	19.40	112.44	19.55
16	125.57	19.73	121.90	19.51	132.18	19.74*
18	145.24	19.67*	141.66	19.76*	151.87	19.69
20	164.94	19.70	161.34	19.68	.....	.....
		2)39.37		39.44		39.43
		2)19.685		19.72		19.715
		9.8425		9.86		9.8575
		9.8600				
		9.8575				
		3)29.5600				
		9.8533 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body A e, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.6950	5.1955	.....	7.1766	.....	8.5216	9.7162	.....
Correction for Line	3.7138	5.2220	.....	7.2204	.....	8.5923	9.7968	.....
Hutt. Correction, or Regular Series	3.7638	5.1773	6.2390	7.1229	7.8918	8.5824	9.7968	10.856

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.6729	3.0359	7.3293	13.609	22.249	33.059	46.218	61.801	79.834	100.38	123.49	149.20	193.58
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction	0.3116	1.2581	2.8142	4.952	7.640	10.844	14.556	18.763	23.411	28.50	34.00	39.89	49.61
Friction on 8.3994 feet	0.0312	0.1200	0.2633	0.459	0.708	1.007	1.357	1.756	2.203	2.70	3.24	3.84	4.83
Plus and Minus Pressures	0.2804	1.1381	2.5509	4.493	6.932	9.837	13.199	17.007	21.208	25.80	30.76	36.05	44.78
Plus Pressure	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.356	16.284	19.815	23.61	27.68	34.34
Minus Pressure	0.0703	0.2757	0.6073	1.061	1.624	2.288	3.063	3.651	4.924	5.985	7.15	8.37	10.44

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.								
12 and	24	2.0337							
	48	2.0851	24..48	2.1392					
	72	2.1361	72	2.2061	48..72	2.3308			
	96	2.1387	96	2.2033	96	2.2716	72..96	2.1929	
								10)	21.7375
							Mean 72 lbs. and 96 lbs.		2.1737

rejected.

Law of M. Press. A e | 1.9715 | 1.9477 | 1.9394 | 1.9077 | 1.8799 | 1.8924 | 1.3151 | 2.5397 | 1.8521 | 1.8660 | 1.8106 | 1.8450 | 1.8912 | Mean.

Digitized by Google

TUESDAY, October 30, 1798.

New Conductor, broad bar, and body A e, immersed six feet.

Thermometer in the Air, 52°;—In the Dock, 52°.—Water in the Dock, 12 ft. 6 in.—Wind, S.W. Fresh Breeze.

System Four-fold.

T. W. 51 lbs.	M. W. 12 lbs.
Accel. Wt. Chain 13 ft. 6 in.	

Sec.	Feet.	Differences.
4	11.48	11.48
8	26.50	15.02
12	42.89	16.39
16	58.86	15.97
20	74.04	15.18
24	89.03	14.99
28	103.77	14.74
32	118.40	14.63
34	125.76	7.36
36	133.15	7.36
38	140.33	7.18
40	147.67	7.34
42	155.00	7.33*
44	162.40	7.40
46	169.84	7.44

3)22.17

2)7.39

3.695 Velocity with a Motive Weight of 12 lbs.

TUESDAY, October 30, 1798.

New Conductor, broad bar, and body A e, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 15 in. 6			A. Wt. Chain ft. 15 in. 6		A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	9.55	9.55	12.72	12.72	12.45	12.45
8	26.95	17.40	32.15	19.43	31.15	18.70
12	47.95	21.00	53.55	21.40	51.80	20.65
16	69.30	21.35	74.82	21.27	72.55	20.75
20	90.35	21.05	95.70	20.88	93.02	20.47
22	100.80	10.45	106.05	10.35	103.15	10.13
24	111.15	10.35	116.40	10.35	113.50	10.35
26	121.55	10.40	126.75	10.35	123.70	10.20
28	132.00	10.45	137.10	10.35	134.08	10.38
30	142.30	10.30	147.45	10.35*	144.40	10.32*
32	152.72	10.42*	157.82	10.37	154.80	10.40
34	163.02	10.30	168.20	10.38	165.30	10.50
36	173.50	10.48	.....	.....	.....	.....
		3)31.20		31.10		31.22
		2)10.40		10.3666		10.4066
		5.2000		5.1833		5.2033
		5.1833				
		5.2033				
		3)15.5866				
		5.1955 Velocity with a Motive Weight of 24 lbs.				

MONDAY, October 29, 1798.

New Conductor, broad bar, and body A e, &c.

Thermometer in the Air, 52°;—In the Dock, 52°.—Water in the Dock, 12 ft. 6 in.—Light Airs. Southerly.

System Four-fold.

Total Wt. 195 lbs.			Motive Wt. 48 lbs.	
Accel. Wt. Chain	ft. 14	in. 6	A. Wt. Chain	ft. 14 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.25	3.25	6.40	6.40
4	10.70	7.45	16.12	9.72
6	20.50	9.80	28.35	12.23
8	33.00	12.50	41.30	12.95
10	47.05	14.05	55.62	14.32
12	61.05	14.00	69.72	14.10
14	75.35	14.30	83.05	13.33
16	89.65	14.30	97.35	14.30
18	103.23	13.58	111.55	14.20
20	117.40	14.17	126.20	14.65
22	131.98	14.58*	140.72	14.52*
24	146.30	14.32	154.90	14.18
26	160.50	14.20	169.22	14.32
		3)43.10		43.02
		2)14.3666		14.34
		7.1833		7.17
		7.1700		
		2)14.3533		
		7.1766	Velocity with a Motive Weight of 48 lbs.	

MONDAY, October 29, 1798.

New Conductor, broad bar, and body A e, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain 15 ft.			A. Wt. Chain 15 ft.		A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.35	7.35	4.30	4.30	5.05	5.05
4	19.10	11.75	13.75	9.45	14.80	9.75
6	33.52	14.42	27.10	13.35	28.51	13.71
8	49.45	15.93	42.50	15.40	43.75	15.24
10	65.65	16.20	58.30	15.80	59.93	16.18
12	82.22	16.57	74.90	16.60	76.39	16.46
14	98.75	16.53	91.50	16.60	93.10	16.71
16	115.60	16.85	108.28	16.78	109.80	16.70
18	132.52	16.92	125.10	16.82	126.87	17.07
20	149.38	16.86*	142.10	17.00*	144.05	17.18*
22	166.55	17.17	159.10	17.00	161.10	17.05
		2)34.03		34.00		34.23
		2)17.015		17.00		17.115
		8.5075		8.50		8.5575
		8.5000				
		8.5575				
		3)25.5650				
		8.5216 Velocity with a Motive Weight of 72 lbs.				

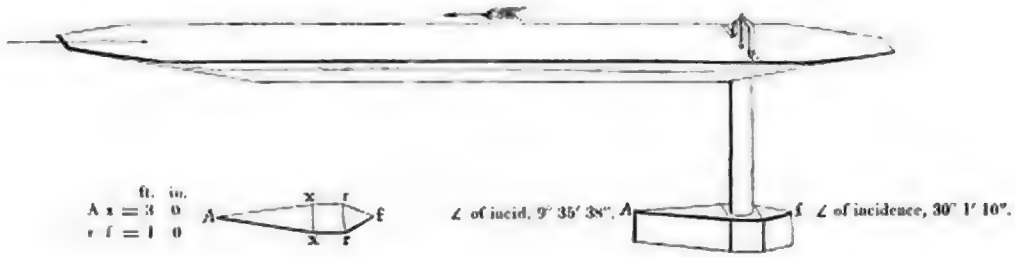
MONDAY, October 29, 1798.

New Conductor, broad bar, and body A e, &c.

System Four-fold.

Total Wt. 394 lbs.			Motive Wt. 96 lbs.	
Accel. Wt. Chain 15 ft.			A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.77	7.77	7.15	7.15
4	20.23	12.46	19.70	12.55
6	35.72	15.49	35.75	16.05
8	53.22	17.50	53.55	17.80
10	71.40	18.18	72.21	18.66
12	90.30	18.90	91.05	18.84
14	109.35	19.05	110.22	19.17
16	128.74	19.39*	129.60	19.38*
18	148.18	19.44	149.12	19.52
20	.....	.....	.....	.....
		2)38.83		38.90
		2)19.415		19.45
		9.7075		9.725
		9.7250		
		2)19.4325		
		9.7162	Velocity with a Motive Weight of 96 lbs.	

New Conductor, broad bar, and body A f, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.4225	4.8733	.....	6.7091	.....	8.0741	9.1891	.....
Correction for Line	3.4400	4.8982	.....	6.7500	.....	8.1411	9.2654	.....
Hutt. Correction, or Regular Series	3.4855	4.8283	5.8425	6.6886	7.4284	8.0932	9.2654	10.291

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.8430	3.6820	8.7223	16.083	25.850	38.097	52.880	70.248	90.246	112.91	138.29	166.41	214.69
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction	0.4817	1.9042	4.2072	7.336	11.241	15.882	21.218	27.210	33.823	41.03	48.80	57.10	70.72
Friction on 7.825 feet	0.0291	0.1118	0.2453	0.428	0.659	0.938	1.264	1.636	2.053	2.52	3.02	3.57	4.50
Plus and Minus Pressures	0.4526	1.7924	3.9619	6.908	10.582	14.944	19.954	25.574	31.770	38.51	45.78	53.53	66.22
Plus Pressure	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.356	16.284	19.815	23.61	27.68	34.34
Minus Pressure	0.2425	0.9300	2.0183	3.476	5.274	7.395	9.818	12.218	15.486	18.695	22.17	25.85	31.88

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.									
12 and	24	1.9614								
	48	2.0566	24..48	2.1615						
	72	2.0799	72	2.1608	48..72	2.1635				
	96	2.0987	96	2.1749	96	2.1883	72..96	2.2239		

10)21.2695

Mean 12 lbs. and 96 lbs. 2.1269

Law of M. Press. A f|1.9392|1.9109|1.8897|1.8684|1.8540|1.8385|1.6377|2.0124|1.7874|1.7887|1.7650|1.7424|1.8362 Mean.

THURSDAY, November 1, 1798.

New Conductor, broad bar, and body A f, immersed six feet.

Thermometer in the Air, 58½°;—In the Dock, 51°.—Water in the Dock, 12 ft. 6 in.—Wind, S.W. Moderate Breeze.

System Four-fold.

Total Wt. 51 lbs. 8 oz.			Motive Wt. 12 lbs.	
Accel. Wt. Chain 10 ft.			A. Wt. Chain 10 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.90	7.90	9.30	9.30
8	19.90	12.00	22.00	12.70
12	33.65	13.75	35.98	13.98
16	47.60	13.95	49.95	13.97
20	61.40	13.80	63.74	13.79
24	74.75	13.35	77.14	13.40
28	88.05	13.30	90.50	13.36
32	101.50	13.45	103.87	13.37
36	114.98	13.48	117.25	13.37
40	128.43	13.45	130.70	13.45
42	135.22	6.79	137.50	6.80
44	141.98	6.76	144.25	6.75
46	148.80	6.82	150.94	6.69
48	155.70	6.90	157.73	6.79*
50	162.50	6.80*	164.50	6.77
52	169.45	6.95	171.39	6.89
54	176.32	6.87	.....	.....
		3)20.62		20.45
		2)6.8733		6.8166
		3.4366		3.4083
		3.4083		
		2)6.8449		
		3.4225	Velocity with a Motive Weight of 12 lbs.	

THURSDAY, November 1, 1798.

New Conductor, broad bar, and body A f, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 12			Accel. Wt. Chain ft. 12		Accel. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	9.50	9.50	10.98	10.98	10.50	10.50
8	25.68	16.18	28.10	17.12	27.14	16.64
12	44.40	18.72	46.85	18.75	45.70	18.56
16	63.62	19.22	66.01	19.16	64.93	19.23
20	82.75	19.13	85.09	19.08	83.95	19.02
24	101.89	19.14	104.30	19.21	102.95	19.00
26	111.50	9.61	113.75	9.45	112.55	9.60
28	121.05	9.55	123.39	9.64	122.20	9.65
30	130.74	9.69	132.99	9.60	131.89	9.69
32	140.50	9.76	142.70	9.71*	141.60	9.71
34	150.20	9.70*	152.39	9.69	151.35	9.75*
36	159.95	9.75	162.17	9.78	161.10	9.75
38	169.73	9.78	.....	.....	170.91	9.81
		3)29.23		29.18		29.31
		2)9.7433		9.7266		9.77
		4.8717		4.8633		4.885
		4.8633				
		4.8850				
		3)14.6200				
		4.8733 Velocity with a Motive Weight of 24 lbs.				

THURSDAY, November 1, 1798.

New Conductor, broad bar, and body A f, &c.

System Four-fold.

T. Wt. 195 lbs			M. Wt. 48 lbs.	
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.
2	6.20	6.20	5.62	5.62
4	15.35	9.15	14.44	8.82
6	26.20	10.85	25.43	10.99
8	38.14	11.94	37.39	11.96
10	50.60	12.46	49.90	12.51
12	63.35	12.75	62.85	12.95
14	76.19	12.84	75.80	12.95
16	89.35	13.16	88.89	13.09
18	102.50	13.15	102.11	13.22
20	115.83	13.33	115.60	13.49
22	129.25	13.42*	128.90	13.30
24	142.64	13.39	142.30	13.40*
26	156.05	13.41	155.70	13.40
28	.....	.....	169.19	13.49
		3)40.22		40.29
		2)13.4066		13.43
		6.7033		6.715
		6.7150		
		2)13.4183		
		6.7091	Velocity with a Motive Weight of 48 lbs.	

THURSDAY, November 1, 1798.

New Conductor, broad bar, and body A f, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.							
Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 in. 6		
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.15	6.15	7.39	7.39	4.52	4.52
4	16.73	10.58	18.87	11.48	13.72	9.20
6	30.00	13.27	32.49	13.62	26.28	12.56
8	44.47	14.47	47.25	14.76	40.78	14.50
10	59.55	15.08	62.50	15.25	55.70	14.92
12	75.10	15.55	78.00	15.50	71.10	15.40
14	90.65	15.55	93.65	15.65	86.70	15.60
16	106.53	15.88	109.58	15.93	102.40	15.70
18	122.54	16.01	125.64	16.06	118.30	15.90
20	138.63	16.09*	141.75	16.11*	134.50	16.20
22	154.80	16.17	157.97	16.22	150.60	16.10*
24	.....	.....	.....	.....	166.80	16.20
		2)32.26		32.33		32.30
		2)16.13		16.165		16.15
		8.0650		8.0825		8.075
		8.0825				
		8.0750				
		3)24.2225				
		8.0742 Velocity with a Motive Weight of 72 lbs.				

THURSDAY, November 1, 1798.

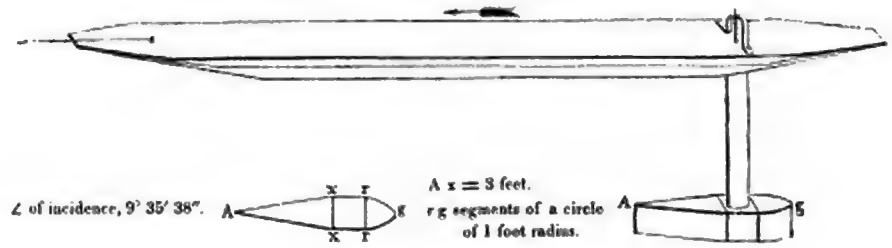
New Conductor, broad bar, and body A f, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.

Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.50	1.50	11.10	11.10	7.56	7.56
4	9.75	8.25	25.80	14.70	20.35	12.79
6	22.55	12.80	42.30	16.50	36.00	15.65
8	38.40	15.85	59.65	17.35	53.00	17.00
10	55.40	17.00	77.50	17.85	70.60	17.60
12	73.18	17.78	95.50	18.00	88.60	18.00
14	91.10	17.82	113.78	18.28	106.87	18.27
16	109.20	18.10	132.20	18.42*	124.95	18.08
18	127.50	18.30	150.60	18.40	143.40	18.45*
20	145.92	18.42*	.....	.....	161.70	18.30
22	164.20	18.28	.....	.....	.....	.....
		2)36.70		36.82		36.75
		2)18.35		18.41		18.375
		9.1750		9.205		9.1875
		9.2050				
		9.1875				
		3)27.5675				
		9.1891 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body A g, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.5800	4.9839	.....	6.8755	.....	8.2608	9.4962	.....
Correction for Line	3.5983	5.0093	.....	6.9174	.....	8.3294	9.5750	.....
Hutt. Correction, or Regular Series	3.6075	4.9948	6.0420	6.9156	7.6793	8.3654	9.5750	10.633

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.7804	3.4154	8.1016	14.953	24.053	35.469	49.258	65.466	84.135	105.30	129.01	155.29	200.42
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction....	0.4191	1.6376	3.5865	6.206	9.444	13.254	17.596	22.428	27.712	33.42	39.52	45.98	56.45
Friction on 8.186 feet.....	0.0301	0.1170	0.2566	0.447	0.690	0.982	1.322	1.711	2.148	2.63	3.16	3.74	4.71
Plus and Minus Pressures..	0.3890	1.5206	3.3299	5.759	8.754	12.272	16.274	20.717	25.564	30.79	36.36	42.24	51.74
Plus Pressure	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.356	16.284	19.815	23.61	27.68	34.34
Minus Pressure	0.1789	0.6582	1.3863	2.327	3.446	4.723	6.138	7.361	9.280	10.975	12.75	14.56	17.40

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.									
12 and	24	2.0952								
	48	2.1211	24..48	2.1476						
	72	2.1347	72	2.1605	48..72	2.1828				
	96	2.1247	96	2.1398	96	2.1320	72..96	2.0643		
								10)	21.3027	
							Mean 48 lbs. and 96 lbs.		2.1303	

Law of Minus Press. A g | 1.8794 | 1.8371 | 1.8004 | 1.7596 | 1.7289 | 1.7000 | 1.3007 | 1.9669 | 1.5922 | 1.5729 | 1.5246 | 1.4877 | 0.0355 | =*

* Mean decrease.

FRIDAY, November 2, 1798.

New Conductor, broad bar, and body A g, immersed six feet.

Thermometer in the Air, 54°;—In the Dock, 51°.—Water in the Dock, 12 ft. 6 in.—Wind, S. W. Fresh Breeze.

System Four-fold.

Total Weight 52 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12		A. Wt. Chain ft. 10 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.37	6.37	9.43	9.43	6.30	6.30
8	18.83	12.46	23.05	13.62	17.80	11.50
12	33.64	14.81	38.80	15.75	31.95	14.15
16	49.25	15.61	54.10	15.30	46.70	14.75
20	64.30	15.05	69.23	15.13	61.35	14.65
24	78.90	14.60	83.85	14.62	75.60	14.25
28	93.30	14.40	98.25	14.40	89.70	14.10
32	107.54	14.24	112.65	14.40	103.78	14.07
36	121.80	14.26	127.00	14.35	117.78	14.00
38	128.84	7.04	134.20	7.20	124.90	7.12
40	135.97	7.13	141.35	7.15	131.88	6.98
42	143.00	7.03	148.45	7.10	138.90	7.02
44	150.10	7.10	155.70	7.25*	146.00	7.10
46	157.25	7.15*	162.90	7.20	153.05	7.05
48	164.37	7.12	170.14	7.24	160.20	7.15*
50	171.50	7.13	.....	.....	167.25	7.05
52	.....	.....	.....	.....	174.40	7.15
		3)21.40		21.69		21.35
		2)7.1333		7.23		7.1166
		3.5667		3.615		3.5583
		3.6150				
		3.5583				
		3)10.7400				
		3.5800 Velocity with a Motive Weight of 12 lbs.				

FRIDAY, November 2, 1798.

New Conductor, broad bar, and body A g, &c.

System Four-fold

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 10 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	9.76	9.76	11.75	11.75	10.05	10.05
8	25.40	15.64	29.25	17.50	26.80	16.75
12	43.60	18.20	48.18	18.93	45.70	18.90
16	62.72	19.12	67.40	19.22	65.05	19.35
20	81.95	19.23	86.85	19.45	84.49	19.44
24	101.20	19.25	106.49	19.64	104.10	19.61
26	111.02	9.82	116.37	9.88	113.82	19.72
28	120.83	9.81	126.29	9.92	123.74	9.92
30	130.68	9.85	136.25	9.96	133.64	9.90
32	140.64	9.96	146.15	9.90*	143.47	9.83
34	150.53	9.89*	156.15	10.00	153.42	9.95*
36	160.54	10.01	166.09	9.94	163.39	9.97
38	170.58	10.04	.....	.....	173.40	10.01
		3)29.94		29.84		29.93
		2)9.98		9.9466		9.9766
		4.9900		4.9733		4.9883
		4.9733				
		4.9883				
		3)14.9516				
		4.9839 Velocity with a Motive Weight of 24 lbs.				

FRIDAY, November 2, 1798.

New Conductor, broad bar, and body A g, &c.

System Four-fold.

Total Weight 195 lbs. 8 oz. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.39	4.39	5.65	5.65	6.00	6.00
4	12.27	7.88	14.80	9.15	15.05	9.05
6	22.96	10.69	26.23	11.43	26.49	11.44
8	35.25	12.29	38.82	12.59	39.25	12.76
10	48.20	12.95	51.98	13.16	52.39	13.14
12	61.50	13.30	65.50	13.52	65.80	13.41
14	74.77	13.27	79.00	13.50	79.35	13.55
16	88.43	13.66	92.70	13.70	93.05	13.70
18	102.15	13.72	106.34	13.64	106.78	13.73
20	115.75	13.60	120.20	13.86	120.45	13.67
22	129.50	13.75*	134.00	13.80*	134.30	13.85*
24	143.19	13.69	147.73	13.73	147.90	13.60
26	156.97	13.78	161.50	13.77	161.69	13.79
		3)41.22		41.30		41.24
		2)13.74		13.7666		13.7466
		6.8700		6.8833		6.8733
		6.8833				
		6.8733				
		3)20.6266				
		6.8755 Velocity with a Motive Weight of 48 lbs.				

FRIDAY, November 2, 1798.

New Conductor, broad bar, and body A g, &c.

System Four-fold.

Total Weight 294 lbs. 8 oz. Motive Weight 72 lbs.

	Accel. Wt. Chain 14 ft.		A. Wt. Chain 14 ft		A. Wt. Chain 14 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.85	5.85	6.50	6.50	4.62	4.62
4	16.30	10.45	17.30	10.80	14.10	9.48
6	29.95	13.65	30.90	13.60	26.95	12.85
8	44.95	15.00	45.95	14.05	41.50	14.55
10	60.60	15.65	61.30	15.35	57.00	15.50
12	76.50	15.90	77.20	15.90	72.75	15.75
14	92.70	16.20	93.10	15.90	88.72	15.97
16	109.05	16.35	109.35	16.25	104.80	16.08
20†	125.30	16.25	125.60	16.25	121.15	16.35
22†	141.95	16.65*	142.10	16.50*	137.60	16.45
24†	158.48	16.53	158.55	16.45	154.15	16.55*
26†	.....	.....	.....	.....	170.60	16.45
		2)33.18		32.95		33.00
		2)16.59		16.475		16.50
		8.2950		8.2375		8.25
		8.2375				
		8.2500				
		3)24.7825				
		8.2608 Velocity with a Motive Weight of 72 lbs.				

† Query 18, 20, 22, 24?

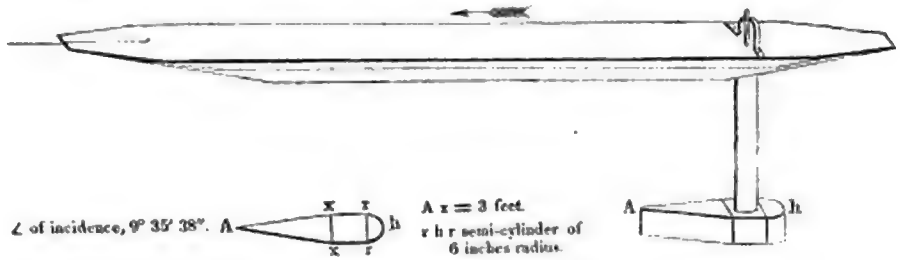
FRIDAY, November 2, 1798.

New Conductor, broad bar, and body A g, &c.

System Four-fold.

Total Weight 394 lbs.			Motive Wt. 96 lbs.	
Accel. Wt.	Chain	ft. 14	A. Wt.	Chain ft. 14
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.60	7.60	7.15	7.15
4	20.45	12.85	19.55	12.40
6	36.50	16.05	35.45	15.90
8	53.90	17.40	52.80	17.35
10	71.90	18.00	70.82	18.02
12	90.57	18.67	89.35	18.53
14	109.12	18.55	107.93	18.58
16	127.92	18.80	126.85	18.92
18	146.84	18.92*	145.95	19.10*
20	165.84	19.00	164.90	18.95
		2)37.92		38.05
		2)18.96		19.025
		9.4800		9.5125
		9.5125		
		2)18.9925		
		9.4962	Velocity with a Motive Weight of 96 lbs.	

New Conductor, broad bar, and body A h, immersed six feet.



	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment.....	3.6883	5.1966	6.1966	7.0333	7.8188	8.4516	9.6775
Correction for Line	3.7071	5.2231	6.2344	7.0762	7.8663	8.5217	9.7578
Hutt. Correction, or Regular Series	3.7534	5.1545	6.2054	7.0785	7.8396	8.5217	9.7208

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.6667	3.0322	7.3545	13.790	22.456	33.447	46.842	62.716	81.125	102.13	125.78	152.12	197.63
Conductor and Bar.....	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction....	0.3054	1.2544	2.8394	5.043	7.847	11.232	15.180	19.678	24.702	30.25	36.29	42.81	53.66
Friction on 7.743 feet	0.0288	0.1107	0.2427	0.423	0.653	0.928	1.250	1.619	2.032	2.49	2.99	3.54	4.45
Plus and Minus Pressures..	0.2766	1.1437	2.5967	4.620	7.194	10.304	13.930	18.059	22.670	27.76	33.30	39.27	49.21
Plus Pressure	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.356	16.284	19.815	23.61	27.68	34.34
Minus Pressure	0.0665	0.2813	0.6531	1.188	1.886	2.755	3.794	4.703	6.386	7.945	9.69	11.59	14.87

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.											
12 and	24	2.0218										
	36	2.1134	24..36	2.2908								
	48	2.1443	48	2.2828	36..48	2.2715						
	60	2.1392	60	2.2377	60	2.1970	48..60	2.1081				
	72	2.1526	72	2.2442	72	2.2178	72	2.1814	60..72	2.2782		
	96	2.1486	96	2.2182	96	2.1894	96	2.1571	96	2.1812	72..96	2.1239

21)45.8092

Mean 48 lbs. and 72 lbs. . 2.1852*

							rejected.						
Law of M. Press. A h	2.0807	2.0774	2.0797	2.0712	2.0785	2.0757	1.1590	2.6092	2.0732	2.0832	2.0578	2.0805	2.0858 Mean.

* *Query 2.1857?*

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body A h, immersed six feet.

Thermometer in the Air, 64°;—In the Dock, 57°.—Water in the Dock, 12 feet 9 inches.—Calm.

System Four-fold.

Total Wt. 49 lbs. 11 oz.			Motive Wt. 12 lbs.	
Accel. Wt. Chain 10 ft.			A. Wt. Chain 10 ft.	
Sec.	Feet	Differences.	Feet.	Differences.
4	7.49	7.49	4.47	4.47
8	19.30	11.81	14.86	10.39
12	33.42	14.12	28.44	13.58
16	48.11	14.69	42.80	14.36
20	62.77	14.66	57.40	14.60
24	77.10	14.33	71.83	14.43
28	91.48	14.38	85.98	14.15
32	105.69	14.21	100.11	14.13
36	120.00	14.31	114.25	14.14
38	127.19	7.19	128.48	14.23
40	134.40	7.21	135.72	7.24
42	141.60	7.20	142.82	7.10
44	148.87	7.27	150.05	7.23
46	156.11	7.24	157.31	7.26
48	163.43	7.32*	164.70	7.39*
50	170.79	7.36	172.00	7.30
52	178.20	7.41	179.48	7.48
		3)22.09		22.17
		2)7.3633		7.39
		3.6816		3.695
		3.6950		
		2)7.3766		
		3.6883 Velocity with a Motive Weight of 12 lbs.		

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body A h, &c.

System Four-fold.

Total Weight 97 lbs. 11 oz. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10		A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.77	4.77	6.00	6.00	5.69	5.69
8	17.62	12.85	19.73	13.73	19.09	13.40
12	34.80	17.18	37.10	17.37	46.49	17.40
16	53.57	18.77	56.16	19.06	55.20	18.71
20	73.05	19.48	75.70	19.54	74.59	19.39
24	92.74	19.69	95.69	19.99	94.40	19.81
26	102.88	9.74†	105.73	10.04	104.40	10.00
28	112.85	9.97	115.91	10.18	114.56	10.16
30	123.09	10.24	126.10	10.19	124.72	10.16
32	133.30	10.21	136.43	10.33	134.99	10.27
34	143.66	10.36	146.71	10.28*	145.30	10.31
36	154.00	10.34*	157.10	10.39	155.70	10.40*
38	164.27	10.27	167.57	10.47	166.13	10.43
40	174.76	10.49	.....	.....	176.60	10.47
		3)31.10		31.14		31.30
		2)10.3666		10.380		10.4333
		5.1833		5.190		5.2166
		5.1900				
		5.2166				
		3)15.5899				
		5.1966 Velocity with a Motive Weight of 24 lbs.				

† Query 10.14?

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body A h, &c.

System Four-fold.

Total Weight 147 lbs. Motive Weight 36 lbs.

	Accel. Wt. Chain 10 ft.		A. Wt. Chain 14 ft.		A. Wt. Chain 14 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.47	1.47	2.84	2.84	2.39	2.39
4	6.00	4.53	8.78	5.94	8.27	5.88
6	13.05	7.05	17.36	8.58	16.98	8.71
8	22.04	8.99	27.70	10.44	27.31	10.33
10	32.35	10.31	38.99	11.29	39.00	11.69
12	43.38	11.03	50.85	11.86	50.77	11.77
14	54.83	11.45	62.80	11.95	62.90	12.13
16	66.50	11.67	74.69	12.16	75.08	12.18
18	78.21	11.71	86.97	12.01	87.00	11.92
20	90.33	12.12	99.10	12.13	99.31	12.31
22	102.32	11.99	111.38	12.28	111.50	12.19
24	114.60	12.28	123.72	12.34	124.06	12.56
26	126.90	12.30*	136.06	12.34*	136.24	12.18*
28	139.29	12.39	148.45	12.39	148.60	12.36
30	151.70	12.41	161.02	12.57	161.20	12.60
		3)37.10		37.30		37.14
		2)12.3666		12.4333		12.38
		6.1833		6.2166		6.19
		6.2166				
		6.1900				
		3)18.5899				
		6.1966 Velocity with a Motive Weight of 36 lbs.				

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body A h, &c.

System Four-fold.

Total Weight 196 lbs. Motive Wt. 48 lbs.

Accel. Wt. Chain ft. 14			A. Wt. Chain ft. 14		A. Wt. Chain ft. 14	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	0.93	0.93	2.09	2.09	0.78	0.78
4	6.29	5.36	8.49	6.40	5.71	4.93
6	15.02	8.73	18.12	9.63	14.19	8.48
8	26.30	11.28	29.89	11.77	25.81	11.62
10	38.86	12.56	42.79	12.80†	38.56	12.75
12	52.10	13.24	56.11	13.32	52.42	13.86
14	65.79	13.69	69.90	13.79	66.32	13.90
16	79.40	13.61	83.49	13.99‡	80.33	14.01
18	93.29	13.89	97.43	13.84§	94.37	14.04
20	107.08	13.79	111.30	13.97‖	108.18	13.81
22	121.12	14.04	125.34	14.04	122.47	14.29
24	135.18	14.06*	139.40	14.06*	136.37	13.90*
26	149.00	13.82	153.51	14.11	150.60	14.23
28	163.13	14.13	167.71	14.20	164.69	14 09
		3)42.01		42.37		42.22
		2)14.0033		14.1233		14.0733
		7.0016		7.0616		7.0366
		7.0616				
		7.0366				
		3)21.0998				
		7.0332	Velocity with a Motive Weight of 48 lbs.			

* Query 12.90? ‡ Query 13.59? § Query 13.94? ‖ Query 13.87?

Digitized by Google

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body A h, &c.

System Four-fold.

Total Weight 245 lbs. Motive Weight 60 lbs.						
Accel. Wt. Chain ft. 14			A. Wt. Chain ft. 15		A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.98	1.98	4.66	4.66	3.45	3.45
4	9.03	7.05	13.78	9.12	11.76	8.31
6	20.11	11.08	26.16	12.38	23.67	11.91
8	33.61	13.50	40.47	14.31	37.79	14.12
10	48.31	14.70	55.39	14.92	52.74	14.95
12	63.45	15.14	70.75	15.36	68.03	15.29
14	78.70	15.25	86.13	15.38	83.53	15.50
16	94.17	15.47	101.48	15.35	99.10	15.57
18	109.67	15.50	117.02	15.54	114.77	15.67
20	125.21	15.54*	132.60	15.58*	130.41	15.64*
22	140.70	15.49	148.30	15.70	146.30	15.89
24	156.34	15.64	163.80†	15.58	161.98	15.68
		3)46.67		46.86		47.21
		2)15.5566		15.62		15.7366
		7.7783		7.81		7.8683
		7.8100				
		7.8683				
		3)23.4566				
		7.8188 Velocity with a Motive Weight of 60 lbs.				

† Query 163.88?

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body A h, &c.

System Four-fold.

Total Weight 295 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain 15 ft.			A. Wt. Chain 15 ft.		A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.39	1.39	2.79	2.79	1.62	1.62
4	8.29	6.90	11.10	8.31	9.15	7.53
6	19.64	11.35	23.58	12.48	20.90	10.75
8	23.97	14.33	38.85	15.27	35.64	14.74
10	49.77	15.80	54.99	16.14	51.48	15.84
12	66.20	16.43	71.64	16.65	67.97	16.49
14	82.81	16.61	88.29	16.65	84.56	16.59
16	99.50	16.69	105.01	16.72	101.35	16.79
18	116.09	16.59	121.98	16.97	118.25†	16.93
20	132.98	16.89	138.87	16.89	135.08	16.80*
24†	149.70	16.72*	155.78	16.91*	152.15	17.07
26†	166.73	17.03	172.67	16.89	.....	.....
		2)33.75		33.80		33.87
		2)16.875		16.90		16.935
		8.4375		8.45		8.4675
		8.4500				
		8.4675				
		3)25.3550				
		8.4516 Velocity with a Motive Weight of 72 lbs.				

† Query 22, 24? ‡ Query 118.28?

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body A h, &c.

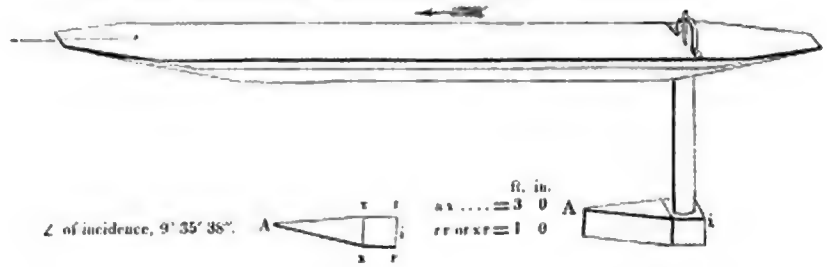
System Four-fold.

Total Weight 393 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 15			A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.70	1.70	2.50	2.50	1.86	1.86
4	4.51	4.51†	12.19	9.69	10.76	8.90
6	15.29	10.78	26.82	14.63	24.91	14.15
8	30.50	15.21	44.05	17.23	42.11	17.20
10	48.13	17.63	62.38	18.33	60.63	18.52
12	66.50	18.47‡	81.20	18.82	79.60	18.97
14	85.31	18.81	100.10	18.90	98.79	19.19
16	104.64	19.33	119.31	19.21	117.93	19.14
18	123.97	19.33*	138.64	19.33*	137.27	19.34*
20	143.19	19.22	158.10	19.46	156.72	19.45
		2)38.55		38.79		38.79
		2)19.275		19.395		19.395
		9.6375		9.6975		9.6975
		9.6975				
		9.6975				
		3)29.0325				
		9.6775 Velocity with a Motive Weight of 96 lbs.				

† Query 2.81 ?

‡ Query 18.37

New Conductor, broad bar, and body Ai, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.5566	5.0322	.....	6.8933	.....	8.2850	9.4391	.....
Correction for Line	3.5747	5.0579	.....	6.9353	.....	8.3538	9.5174	.....
Hutt. Correction, or Regular Series.	3.6142	4.9909	6.0279	6.8920	7.6467	8.3242	9.5174	10.560

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.7601	3.3674	8.0436	14.920	24.094	35.643	49.629	66.112	85.140	106.76	131.01	157.93	204.26
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction	0.3988	1.5896	3.5285	6.173	9.485	13.428	17.967	23.074	28.717	34.88	41.52	48.62	60.29
Friction on 6.958 feet	0.0258	0.0994	0.2181	0.380	0.586	0.834	1.124	1.455	1.826	2.24	2.69	3.04	4.00
Plus and Minus Pressures	0.3730	1.4902	3.3104	5.793	8.899	12.594	16.843	21.619	26.891	32.64	38.83	45.58	56.29
Plus Pressure	0.2101	0.8624	1.9436	3.432	5.308	7.549	10.136	13.356*	16.284	19.815	23.61	27.68	34.34
Minus Pressure	0.1629	0.6278	1.3668	2.361	3.591	5.045	6.707	8.563	10.607	12.82	15.22	17.90	21.95

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.										
12 and	24	1.9971									
	48	2.0917	24..48	2.1957							
	72	2.1109		72	2.1895	48..72	2.1788				
	96	2.1235		96	2.1929		96	2.1901	72..96	2.2061	
										10)21.4763	
									Mean 12 lbs. and 96 lbs. .		2.1476

Law of P. Pres. A i	2.0372	2.0041	1.9765	1.9542	1.9318	1.9117	2.0660	1.8784	1.8627	1.8385	1.8278	1.8000	0.0227 } Mean
Law of M. Pres. A i	1.9464	1.9188	1.9000	1.8793	1.8647	1.8473	1.8296	1.8175	1.7985	1.8005	1.8640	1.7028	0.0176 } decrease.

* *Should be 13.056?*

563

THURSDAY, November 1, 1798.

New Conductor, broad bar, and body A i, immersed six feet.

Thermometer in the Air, 58½°;—In the Dock, 51°.—Water in the Dock, 12 ft. 6 in.—Wind, S.W. Moderate.

System Four-fold.

Total Weight 51 lbs. 8 oz. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.72	8.72	8.50	8.50	8.90	8.90
8	22.35	13.63	21.90	13.40	22.80	13.90
12	38.20	15.85	37.60	15.70	38.65	15.85
16	53.90	15.70	53.30	15.70	54.60	15.95
20	69.08	15.18	68.38	15.08	69.90	15.30
24	83.58	14.50	82.72	14.34	84.50	14.60
28	97.78	14.20	96.80	14.08	98.65	14.15
32	111.80	14.02	110.70	13.90	112.80	14.15
36	125.80	14.00	124.70	14.00	126.90	14.10
40	139.72	13.92	138.65	13.95	133.95	7.05
42	146.70	6.98	145.67	7.02	140.95	7.00
44	153.72	7.02	152.77	7.10	147.98	7.03
46	160.82	7.10*	159.87	7.10*	155.06	7.08
48	167.95	7.13	166.97	7.10	162.15	7.09*
50	175.04	7.09	174.07	7.10	169.30	7.15
52	.....	.....	.....	.....	176.46	7.16
		3)21.32		21.30		21.40
		2)7.1066		7.10		7.1333
		3.5533		3.55		3.5666
		3.5500				
		3.5666				
		3)10.6699				
		3.5566 Velocity with a Motive Weight of 12 lbs.				

THURSDAY, November 1, 1798.

New Conductor, broad bar, and body A i, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	13.22	13.22	12.90	12.90	13.12	13.12
8	32.15	18.93	31.70	18.30	32.12	19.00
12	52.38	20.23	52.00	20.30	52.37	20.25
16	72.37	19.99	72.10	20.10	72.55	20.18
20	92.22	19.85	91.75	19.65	92.30	19.75
24	112.00	19.78	111.48	19.73	112.00	19.70
26	122.10	10.10	121.48	10.00	122.00	10.00
28	132.05	9.95	131.45	9.97	131.92	9.92
30	142.10	10.05	141.52	10.07	141.96	10.04
32	152.12	10.02*	151.68	10.16*	152.00	10.04*
34	162.18	10.06	161.68	10.00	162.06	10.06
36	172.22	10.04	171.81	10.13	172.13	10.07
		3)30.12		30.29		30.17
		2)10.04		10.0966		10.0566
		5.0200		5.0483		5.0283
		5.0483				
		5.0283				
		3)15.0966				
		5.0322 Velocity with a Motive Weight of 24 lbs.				

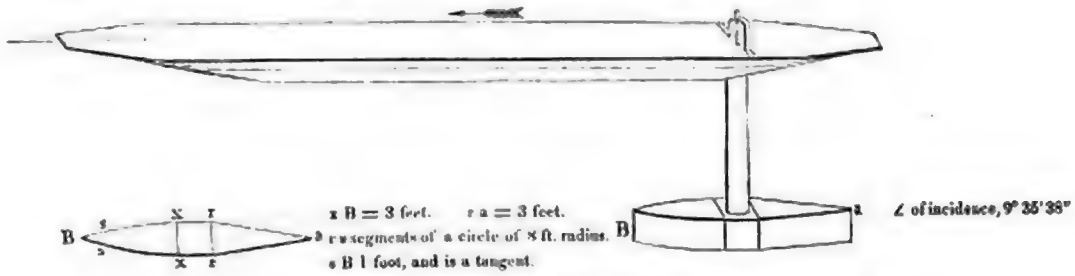
THURSDAY, November 1, 1798.

New Conductor, broad bar, and body A i, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft. 6 in.		A. Wt. Chain 12 ft. 6 in.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	9.00	9.00	6.52	6.52	8.80	8.80
4	22.40	13.40	18.72	12.20	22.20	13.40
6	38.55	16.15	34.30	15.58	38.68	16.48
8	56.15	17.60	51.70	17.40	56.32	17.64
10	74.10	17.95	69.58	17.88	74.30	17.98
12	92.80	18.70	87.98	18.40	92.95	18.65
14	111.40	18.60	106.65	18.67	111.55	18.60
16	130.35	18.95*	125.50	18.85	130.45	18.90
18	149.30	18.95	144.37	18.87*	149.32	18.87*
20	.....	.....	163.16	18.79	168.16	18.84
		2)37.90		37.66		37.71
		2)18.95		18.83		18.855
		9.4750		9.415		9.4275
		9.4150				
		9.4275				
		3)28.3175				
		9.4391 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body B a, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.9000	5.4033	.....	7.3225	.....	8.7625	10.0075	.....
Correction for Line	3.9199	5.4309	.....	7.3672	.....	8.8352	10.0905	.....
Hutt. Correction, or Regular Series	3.9269	5.3739	6.4562	7.3540	8.1355	8.8352	10.0638	11.133

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.5842	2.7023	6.6193	12.498	20.465	30.618	43.043	57.815	75.000	94.660	116.85	141.62	184.53
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction.....	0.2229	0.9245	2.1042	3.751	5.856	8.403	11.381	14.777	18.577	22.776	27.36	32.31	40.56
Friction on 10.800 feet	0.0401	0.1543	0.3386	0.590	0.910	1.295	1.745	2.258	2.834	3.472	4.17	4.93	6.21
Plus and Minus Pressures...	0.1828	0.7702	1.7656	3.161	4.946	7.108	9.636	12.519	15.743	19.304	23.19	27.38	34.35
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure	0.1780	0.7506	1.7205	3.079	4.817	6.916	9.370	12.169	15.293	18.748	22.50	26.56	33.29

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.		lbs.	
12 and	24	2.1259						
	48	2.1970	24..48	2.2731				
	72	2.2048	72	2.2575	48..72	2.2314		
	96	2.1992	96	2.2378	96	2.2036	72..96	2.1655

10)22.0958

Mean 12 lbs. and 72 lbs. 2.2096

Law of Plus Pressure B a |2.0762|2.0458|2.0433|1.9795|1.9838|1.9699|1.9529|1.9401|1.9333|1.9141|1.9066|1.8855|0.0181|=*

* Mean decrease.

Digitized by Google

TUESDAY, November 20, 1798.

New Conductor, broad bar, and body B a, immersed six feet.

Thermometer in the Air, 42°.—Water in the Dock, 12 feet 3 inches.

System Four-fold.

Total Wt. 52 lbs.			M. Wt. 12 lbs.	
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.20	4.20	3.55	3.55
8	15.30	11.10	14.00	10.45
12	30.33	15.03	28.80	14.80
16	46.72	16.39	45.20	16.40
20	62.94	16.22	61.52	16.32
24	78.75	15.81	77.30	15.78
28	94.29	15.54	92.85	15.55
32	109.70	15.41	108.20	15.35
36	125.18	15.48	123.65	15.45
38	132.87	7.69	131.30	7.65
40	140.59	7.72	139.00	7.70
42	148.40	7.81	146.70	7.70
44	156.15	7.75	154.55	7.85*
46	163.97	7.82*	162.30	7.75
48	171.75	7.78	.....	.....
		2)15.60		15.60
		2)7.80		7.80
		3.90		3.90
		3.90		
		2)7.80		
		3.90	Velocity with a Motive Weight of 12 lbs.	

TUESDAY, November 20, 1798.

New Conductor, broad bar, and body B a, &c.

System Four-fold.

Total Weight 98 lbs. Motive 24 lbs.

Accel. Wt. Chain ft. 11 in. 6			A. Wt. Chain ft. 11 in. 6		A. Wt. Chain ft. 11 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	13.30	13.30	5.80	5.80	4.29	4.29
8	32.20	18.90	21.05	15.25	18.34	14.05
12	52.84	20.64	40.80	19.75	37.65	19.31
16	73.82	20.98	61.75	20.95	58.39	20.74
20	94.90	21.08	82.74	20.99	79.30	20.91
24	116.00	21.10	103.89	21.15	100.45	21.15
26	126.81	10.81	114.50	10.61	111.03	10.58
28	137.44	10.63	125.15	10.65	121.71	10.68
30	148.30	10.86*	135.95	10.80	132.55	10.84
32	159.09	10.79	146.70	10.75*	143.30	10.75*
34	169.90	10.81	157.52	10.82	154.11	10.81
36	.....	.....	168.40	10.88	164.90	10.79
		3)32.46		32.45		32.35
		2)10.82		10.8166		10.7833
		5.4100		5.4083		5.3916
		5.4083				
		5.3916				
		3)16.2099				
		5.4033 Velocity with a Motive Weight of 24 lbs.				

TUESDAY, November 20, 1798.

New Conductor, broad bar, and body B a, &c.

System Four-fold.

Total Wt. 195 lbs.			Motive Wt. 48 lbs.	
Accel. Wt. Chain	ft. 11	in. 6	A. Wt. Chain	ft. 11 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.54	1.54	6.19	6.19
4	7.40	5.86	14.73	8.54
6	16.30	8.90	25.60	10.87
8	27.50	11.20	38.02	12.42
10	40.23	12.73	51.43	13.41
12	53.63	13.40	65.20	13.77
14	67.47	13.84	79.37	14.17
16	81.68	14.21	93.60	14.23
18	96.03	14.35	107.97	14.37
20	110.52	14.49	122.45	14.68
22	125.30	14.78*	137.05	14.60*
24	139.95	14.65	151.62	14.57
26	154.55	14.60	166.29	14.67
		3)44.03		43.84
		2)14.6766		14.6133
		7.3383		7.3066
		7.3066		
		2)14.6449		
		7.3224	Velocity with a Motive Weight of 48 lbs.	

TUESDAY, November 20, 1798.

New Conductor, broad bar, and body B a, &c.

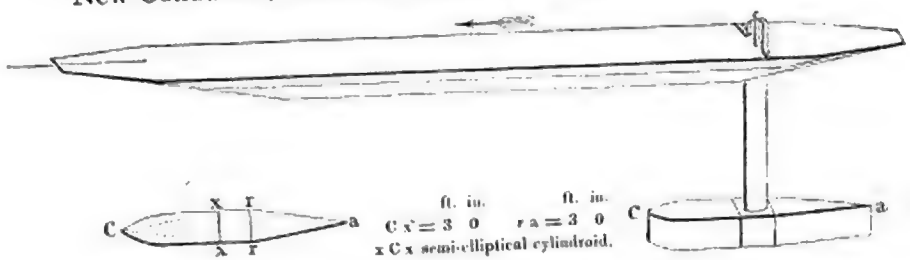
System Four-fold.

Total Weight 296 lbs.			Motive Wt. 72 lbs.	
Accel. Wt. Chain ft. 16			A. Wt. Chain ft. 16	
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.29	5.29	3.70	3.70
4	13.23	7.94	12.40	8.70
6	26.25	13.02	25.34	12.94
8	41.53	15.28	40.34	15.00
10	57.80	16.27	56.70	16.36
12	74.52	16.72	73.55	16.85
14	91.50	16.98	90.40	16.85
16	108.69	17.19	107.70	17.30
18	126.15	17.46	125.00	17.30
20	143.65	17.50*	142.55	17.55*
22	161.20	17.55	160.05	17.50
		2)35.05		35.05
		2)17.525		17.525
		8.7625		8.7625
		8.7625		
		2)17.5250		
		8.7625 Velocity with a Motive Wt. of 72 lbs.		

System Four-fold.

Total Weight 395 lbs.			Motive Weight 96 lbs.	
Accel. Wt. Chain ft. 16			A. Wt. Chain ft. 16	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.74	7.74	5.30	5.30
4	20.60	12.86	16.69	11.39
6	37.35	16.75	32.20	15.51
8	55.72	18.37	50.02	17.82
10	74.83	19.11	69.05	19.03
12	94.38	19.55	88.52	19.47
14	114.40	20.02	108.35	19.83
16	134.34	19.94*	128.35	20.00
18	154.40	20.06	148.29	19.94*
20	.....	.....	168.41	20.12
		2)40.00		40.06
		2)20.00		20.03
		10.000		10.015
		10.015		
		2)20.015		
		10.0075 Velocity with a Motive Weight of 96 lbs.		

New Conductor, broad bar, and body C a, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.7411	5.2791	.....	7.190	.....	8.6791	9.915	.....
Correction for Line	3.7602	5.3060	.....	7.2339	.....	8.7511	9.9973	.....
Hutt. Correction, or Regular Series	3.7897	5.2364	6.3206	7.2354	8.0291	8.7418	9.9973	11.094

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.6900	3.0490	7.2716	13.473	21.737	32.132	44.714	59.536	76.636	96.056	117.83	142.00	183.56
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction.....	0.3287	1.2712	2.7565	4.726	7.128	9.917	13.052	16.498	20.213	24.172	28.34	32.69	39.59
Friction on 11.605 feet.....	0.0431	0.1658	0.3638	0.634	0.978	1.392	1.875	2.426	3.045	3.731	4.48	5.30	6.68
Plus and Minus Pressures ..	0.2856	1.1054	2.3927	4.092	6.150	8.525	11.177	14.072	17.168	20.441	23.86	27.39	32.91
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure.....	0.2808	1.0858	2.3476	4.010	6.021	8.333	10.911	13.722	16.718	19.885	23.17	26.57	31.85

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.		lbs.	
12 and	24	2.0127	24..48	2.2365	48..72	2.1295	72..96	2.1608
	48	2.1187	72	2.2008	96	2.1424		
	72	2.1211	96	2.1884				
	96	2.1266						

10) 21.4375

Mean 48 lbs. and 96 lbs.. 2.1437

rejected.

Law of Plus Press. C a |1.9512|1.9017|1.8610|1.8215|1.7824|1.7960|1.6620|1.6767|1.6466|1.6041|1.5737|1.5132|0.0415| = *

* Mean decrease.

SATURDAY, October 20, 1798.

New Conductor, broad bar, and body C a, immersed six feet.

System Four-fold.

Total Weight 51 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 11			A. Wt. Chain ft. 11		A. Wt. Chain ft. 11	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.38	5.38	5.04	5.04	7.27	7.27
8	17.90	12.52	16.49	11.05	20.11	12.84
12	34.26	16.36	31.50	15.01	35.80	15.69
16	51.30	17.04	47.73	16.23	51.83	16.03
20	67.75	16.45	63.71	15.98	67.59	15.76
24	83.46	15.71	79.11	15.40	82.62	15.09†
28	98.76	15.30	94.17	15.06	97.71	15.03‡
32	113.80	15.04	109.01	14.84	112.50	14.79
36	127.78	13.98	123.77	14.76	127.30	14.80
38	136.23	8.45	131.17	7.40	134.71	7.41
40	143.74	7.51	138.48	7.31	142.11	7.40
42	151.17	7.43	145.90	7.42	149.54	7.43
44	158.62	7.45*	153.31	7.41	157.02	7.48*
46	166.13	7.51	160.78	7.47*	164.53	7.51
48	173.56	7.43	168.28	7.50	172.03	7.50
50	.....	.....	175.77	7.49	.....	.....
		3)22.39		22.46		22.49
		2)7.4633		7.4866		7.4966
		3.7316		3.7433		3.7483
		3.7433				
		3.7483				
		3)11.2232				
		3.7411 Velocity with a Motive Weight of 12 lbs.				

† Query 15.03? ‡ Query 15.09?

SATURDAY, October 20, 1798.

New Conductor, broad bar, and body C a, &c.

System Four-fold,

Total Wt. 97 lbs. 12 oz.			Motive Wt. 24 lbs.	
Accel. Wt. Chain 11 ft.			Accel. Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.31	7.31	4.48	4.48
8	22.70	15.39	18.13	13.65
12	41.77	19.07	36.97	18.84
16	62.19	20.42	57.30	20.33
20	82.69	20.50	77.87	20.57
24	103.38	20.69	98.42	20.55
26	113.64	10.26	108.80	10.38
28	124.12	10.48	119.19	10.39
30	134.49	10.37	129.70	10.51
32	145.10	10.61*	140.13	10.43
34	155.56	10.46	150.70	10.57*
36	166.10	10.54	161.27	10.57
38	.....	.....	171.87	10.60
		3)31.61		31.74
		2)10.5366		10.58
		5.2683		5.29
		5.2900		
		2)10.5583		
		5.2791	Velocity with a Motive Weight of 24 lbs.	

SATURDAY, October 20, 1798.

New Conductor, broad bar, and body C a, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.50	5.50	3.41	3.41	5.42	5.42
4	14.68	9.18	10.62	7.21	14.45	9.03
6	26.10	11.42	21.06	10.44	26.04	11.59
8	38.80	12.70	33.39	12.33	38.72	12.68
10	52.28	13.48	46.53	13.14	52.19	13.47
12	66.09	13.81	60.16	13.63	66.00	13.81
14	79.35†	13.86	73.99	13.83	79.95	13.95
16	94.02	14.07	87.90	13.91	94.00	14.05
18	108.20	14.18	102.18	14.28	108.28	14.28
20	122.51	14.31	116.31	14.13	122.65	14.37
22	126.72	14.21	130.77	14.46	137.06	14.41
24	151.06	14.34*	145.13	14.36*	151.47	14.41*
26	165.33	14.27	159.60	14.47	165.90	14.43
		2)28.61		28.83		28.84
		2)14.305		14.415		14.42
		7.1525		7.2075		7.21
		7.2075				
		7.2100				
		3)21.5700				
		7.1900 Velocity with a Motive Weight of 48 lbs.				

† Query 79.95?

N. B. By the mean of two experiments a Motive Weight of 67 lbs. 8 oz. drew this body with a Velocity of 8.4622, or nearly five nautical miles per hour (8.4548); by a sail the Motive Weight should be 67.153.

SATURDAY, October 20, 1798.

New Conductor, broad bar, and body C a, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.00	4.00	1.40	1.40	5.05	5.05
4	13.00	9.00	8.07	6.67	14.96	9.91
6	25.66	12.66	19.16	11.09	28.20	13.24
8	40.50	14.84	33.29	14.13	43.30	15.10
10	56.35	15.85	48.60	16.31	59.18	15.88
12	72.60	16.25	64.71	16.11	75.60	16.42
14	89.38	16.78	81.18	16.47	92.29	16.69
16	106.31	16.93	98.12	16.94	109.31	17.02
18	123.58	17.27	115.17	17.05	126.53	17.22
20	140.91	17.33*	132.43	17.26	143.93	17.40*
22	158.22	17.31	149.78	17.35*	161.28	17.35
24	.....	.....	167.19	17.41	.....	.....
		2)34.64		34.76		34.75
		2)17.32		17.38		17.375
		8.6600		8.69		8.6875
		8.6900				
		8.6875				
		3)26.0375				
		8.6792 Velocity with a Motive Weight of 72 lbs.				

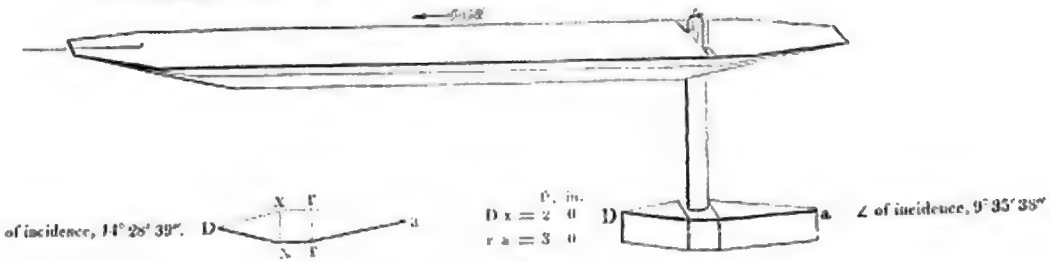
SATURDAY, October 20, 1798.

New Conductor, broad bar, and body C a, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.53	2.53	8.00	8.00	5.50	5.50
4	13.20	10.67	21.30	13.30	16.93	11.43
6	27.85	14.65	37.89	16.59	32.31	15.38
8	44.94	17.09	56.14	18.25	50.17	17.86
10	63.56	18.62	75.09	18.95	68.90	18.73
12	82.55	18.99	94.53	19.44	88.17	19.27
14	102.15	19.60	114.21	19.68	107.88	19.71
16	121.90	19.75	134.00	19.79*	127.48	19.60
18	141.76	19.86*	153.90	19.90	147.37	19.89*
20	161.49	19.73	.....	.....	167.18	19.81
		2)39.59		39.69		39.70
		2)19.795		19.845		19.85
		9.8975		9.9225		9.925
		9.9225				
		9.9250				
		3)29.7450				
		9.9150 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body D a, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.7611	5.3172	.....	7.2333	.....	8.6793	9.8808	.....
Correction for Line	3.7803	5.3443	.....	7.2774	.....	8.7513	9.9628	.....
Hutt. Correction, or Regular Series	3.8370	5.2785	6.3613	7.2618	8.0471	8.7513	10.0003	11.070

	Feet per Second.											
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.6458	2.9126	7.0298	13.136	21.333	31.703	44.319	59.240	76.350	95.995	118.08	142.66	185.08
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction	0.2845	1.1348	2.5147	4.389	6.724	9.488	12.657	16.202	19.927	24.111	28.59	33.35	41.11
Friction on 8.894 feet	0.0330	0.1271	0.2788	0.486	0.749	1.066	1.437	1.859	2.334	2.860	3.44	4.06	5.17
Plus and Minus Pressures	0.2515	1.0077	2.2359	3.903	5.975	8.422	11.220	14.343	17.593	21.251	25.15	29.29	35.94
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure	0.2467	0.9881	2.1908	3.821	5.846	8.230	10.954	13.993	17.143	20.695	24.46	28.47	34.88

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.										
12 and 24	2.0066										
48	2.1214	24..48	2.2450								
72	2.1345	72	2.2276	48..72	2.1986						
96	2.1459	96	2.2258	96	2.2072	72..96	2.2187				

10)21.7311

Mean 48 lbs. and 72 lbs. 2.1731

Law of Plus Press. D a |1.5110 (rejected.) |1.9638|1.9335|1.9057|1.8760|1.8548|1.8337|1.7238 (rejected.) |1.7872|1.7537|1.7448|1.6953|0.0253|=*

* Mean decrease.

FRIDAY, October 26, 1798.

New Conductor, broad bar, and body D a, immersed six feet.

Thermometer in the Air, 61¼°;—In the Dock, 53¼°.—Water in the Dock, 12 feet.—Wind, S.W. Fresh Breeze.

System Four-fold.

Total Weight 51 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain 8 ft.			A. Wt. Chain 10 ft.		A. Wt. Chain 10 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.40	3.40	5.00	5.00	5.39	5.39
8	12.23	8.83	16.09	11.09	16.68	11.29
12	23.87	11.64	30.49	14.40	31.04	14.36
16	37.78	13.91	45.82	15.33	46.37	15.33
20	51.16	13.38	61.03	15.21	61.70	15.33
24	65.11	13.95	76.05	15.02	76.93	15.23
28	79.16	14.05	90.90	14.85	91.90	14.97
32	93.20	14.04	105.70	14.80	106.50	14.60
36	107.40	14.20	120.60	14.90	121.40	14.90
40	122.11	14.71	128.05	7.45	128.53	7.13
42	129.05	6.94	135.50	7.45	136.31	7.78
44	136.64	7.59	142.87	7.37	143.34	7.03
46	143.95	7.31	150.55	7.68	151.45	8.11
48	151.35	7.40	157.97	7.42*	158.94	7.49*
50	158.76	7.41*	165.60	7.63	166.43	7.49
52	166.14	7.38	173.15	7.55	174.10	7.67
54	173.80	7.66	.....	.....	.....	.....
		3)22.45		22.60		22.65
		7.4833		7.5333		7.55
		7.5333				
		7.5500				
		3)22.5666				
		2)7.5222				
		3.7611	Velocity with a Motive Weight of 12 lbs.			

N. B. The wind shook the line in the middle of the third set of experiments; the last differences are to be depended upon.

FRIDAY, October 26, 1798.

New Conductor, broad bar, and body D a, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.						
	ft. Accel. Wt. Chain 12		ft. A. Wt. Chain 11		ft. A. Wt. Chain 11	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.50	6.50	5.30	5.30	7.50	7.50
8	22.03	15.53	19.30	14.00	23.03	15.53
12	42.11	20.08	37.80	18.50	42.25	19.22
16	62.80	20.69	57.94	20.14	62.48	20.23
20	83.25	20.45	78.34	20.40	82.82	20.34
24	104.20	20.95	98.93	20.59	103.56	20.74
26	114.50	10.30	109.25	10.32	114.00	10.44
28	125.20	10.70	119.72	10.47	124.50	10.50
30	135.70	10.50	130.15	10.43	135.04	10.54
32	146.39	10.69*	140.79	10.64	145.72	10.68*
34	156.90	10.51	151.35	10.56*	156.39	10.67
36	167.65	10.75	161.91	10.56	167.10	10.71
38	.....	.....	172.49	10.58	.....	.....
		3)31.95		31.70		32.06
		2)10.65		10.5666		10.6866
		5.3250		5.2833		5.3433
		5.2833				
		5.3433				
		3)15.9516				
		5.3172 Velocity with a Motive Weight of 24 lbs.				

FRIDAY, October 26, 1798.

New Conductor, broad bar, and body D a, &c.

System Four-fold.

Total Wt. 195 lbs.			M. Wt. 48 lbs.	
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.60	3.60	7.00	7.00
4	10.85	7.25	17.10	10.10
6	21.30	10.45	29.10	12.00
8	33.63	12.33	42.10	13.00
10	46.80	13.17	55.63	13.53
12	60.60	13.80	69.50	13.87
14	74.82	14.22	83.55	14.05
16	88.95	14.13	97.95	14.40
18	103.30	14.35	112.30	14.35
20	117.70	14.40	126.75	14.45*
22	132.10	14.40*	141.18	14.43
24	146.70	14.60	155.70	14.52
26	161.10	14.40	.....	.....
		3)43.40		43.40
		2)14.4666		14.4666
		7.2333		7.2333
		7.2333		
		2)14.4666		
		7.2333	Velocity with a Motive Weight of 48 lbs.	

FRIDAY, October 26, 1798.

New Conductor, broad bar, and body D a, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 11		A. Wt. Chain ft. 11		A. Wt. Chain ft. 11	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.05	5.05	4.22	4.22	3.40	3.40	4.00	4.00
4	14.50	9.45	13.30	9.08	12.00	8.60	13.20	9.20
6	27.55	13.05	26.18	12.88	24.65	12.65	26.00	12.80
8	42.80	15.25	40.95	14.77	39.20	15.55	40.80	14.80
10	58.12	15.32	56.80	15.85	55.00	15.80	56.73	15.93
12	75.55	17.43	73.22	16.42	71.32	16.32	73.05	16.32
14	92.35	16.80	90.10	16.88	88.15	16.83	89.85	16.80
16	109.52	17.17	107.05	16.95	105.10	16.95	106.85	17.00
18	126.63	17.11	124.38	17.33	122.48	17.38	124.24	17.35*
20	144.07	17.44*	141.70	17.32*	139.80	17.32*	141.55	17.35
22	161.40	17.33	159.03	17.33	157.23	17.43	.....	.....
		2)34.77		34.65		34.75		34.70
		2)17.385		17.325		17.375		17.35
		8.6925		8.6625		8.6875		8.675
		8.6625						
		8.6875						
		8.6750						
		4)34.7175						
		8.6793	Velocity with a Motive Weight of 72 lbs.					

THURSDAY, October 25, 1798.

New Conductor, broad bar, and body D a, &c.

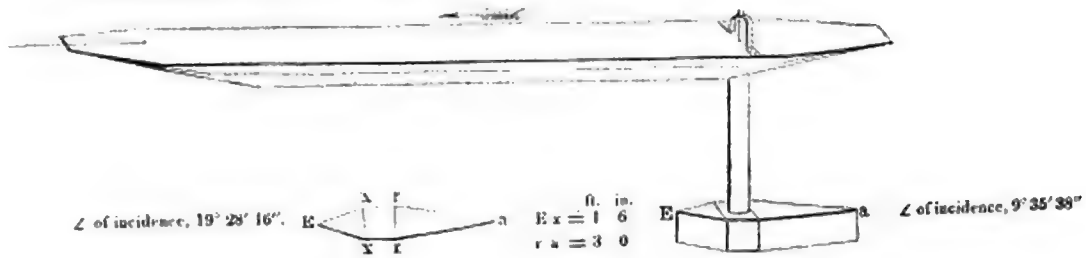
Thermometer in the Air, 50°;—In the Dock, 52½°.—Water in the Dock, 12 feet.—Wind, Southerly. Light Airs.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.

Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.03	5.03	3.50	3.50	7.95	7.95
4	16.38	11.35	13.15	9.65	21.45	13.50
6	31.82	15.44	28.55	15.40	38.05	16.60
8	49.68	17.86	46.30	17.75	56.30	18.25
10	68.32	18.64	64.80	18.50	75.18	18.88
12	87.45	19.13	83.85	19.05	94.58	19.40
14	107.00	19.55	103.55	19.70	114.08	19.50
16	126.80	19.80	123.10	19.55	133.80	19.72*
18	146.53	19.73*	142.88	19.78*	153.50	19.70
20	166.40	19.87	162.65	19.77	.....	.....
		2)39.60		39.55		39.42
		2)19.80		19.775		19.71
		9.9000		9.8875		9.855
		9.8875				
		9.8550				
		3)29.6425				
		9.8808 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body E a, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.6905	5.2441	.....	7.1894	.....	8.5612	9.7265	.....
Correction for Line	3.7093	5.2708	.....	7.2333	.....	8.6323	9.8072	.....
Hutt. Correction, or Regular Series	3.8276	5.2617	6.3384	7.2333	8.0136	8.7132	9.9441	11.016

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.6449	2.9170	7.0585	13.209	21.476	31.945	44.692	59.779	77.251	97.180	119.60	144.56	187.66
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction ..	0.2836	1.1392	2.5434	4.462	6.867	9.730	13.030	16.741	20.828	25.296	30.11	35.25	43.69
Friction on 8.3994 feet....	0.0312	0.1200	0.2633	0.459	0.708	1.007	1.357	1.756	2.203	2.701	3.24	3.84	4.83
Plus and Minus Pressures..	0.2524	1.0192	2.2801	4.003	6.159	8.723	11.673	14.985	18.625	22.595	26.87	31.41	38.86
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure	0.2476	0.9996	2.2350	3.921	6.030	8.531	11.407	14.635	18.175	22.039	26.18	30.59	37.80

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.		lbs.	
12 and	24	1.9727	24..48	2.1899	48..72	2.2933	72..96	2.2545
	48	2.0757	72	2.2269	96	2.2769		
	72	2.1213	96	2.2326				
	96	2.1388						

10)21.7825

Mean 24 lbs. and 48 lbs. 2.1782

Law of Plus Press. E a|2.1034|1.9843|1.9539|1.9288|1.9030|1.8846|1.8658|1.8606|1.8296|1.8066|1.7892|1.7669|0.0224|=*

* Mean decrease.

MONDAY, October 29, 1798.

New Conductor, broad bar, and body E a, immersed six feet.

Thermometer in the Air, 52°;—In the Dock, 52°.—Water in the Dock, 12 ft. 6 in.—Wind, S. E. Light Airs.

System Four-fold.

Total Weight 51 lbs. Motive Weight 12 lbs.

Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.64	3.64	8.50	8.50	6.65	6.65
8	13.53	9.89	20.98	12.48	18.70	12.05
12	26.90	13.37	34.92	13.94	33.90	15.20
16	41.31	14.41	49.42	14.50	50.01	16.11
20	55.76	14.45	63.94	14.52	65.79	15.78
24	70.26	14.50	77.99	14.05	80.95	15.16
28	84.42	14.16	92.29	14.30	95.82	14.87
32	98.58	14.16	106.29	14.00	110.33	14.51
36	112.88	14.30	120.67	14.38	125.05	14.72
40	127.28	14.40	127.85	7.18	132.39	7.34
42	134.52	7.24	135.05	7.20	139.70	7.31
44	141.63	7.11	142.22	7.17	147.03	7.33
46	148.99	7.36	149.50	7.28	154.44	7.41
48	156.30	7.31	156.81	7.31*	161.80	7.36*
50	163.63	7.33*	164.13	7.32	169.21	7.41
52	170.99	7.36	171.58	7.45	176.69	7.48
54	178.40	7.41	.....	.....	.....	.....
		3)22.10		22.08		22.25
		2)7.3666		7.3600		7.4166
		3.6833		3.6800		3.7083
		3.6800				
		3.7083				
		3)11.0716				
		3.6905	Velocity with a Motive Weight of 12 lbs.			

MONDAY, October 29, 1798.

New Conductor, broad bar, and body E a, &c.

System Four-fold.

Total Wt. 98 lbs.			Motive Wt. 24 lbs.	
Accel. Wt. Chain	ft. 12	in. 6	A. Wt. Chain	ft. 12 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
4	13.25	13.25	9.40	9.40
8	31.78	18.53	25.43	16.03
12	52.10	20.32	45.50	20.07
16	72.60	20.50	65.80	20.30
20	93.03	20.43	86.20	20.40
22	103.40	10.37	106.78	20.58
24	113.60	10.20	117.10	10.32
26	124.00	10.40	127.49	10.39
28	134.40	10.40	137.91	10.42
30	144.90	10.50*	148.35	10.44*
32	155.39	10.49	158.80	10.45
34	165.83	10.44	169.41	10.61
		3)31.43		31.50
		2)10.4766		10.50
		5.2383		5.25
		5.2500		
		2)10.4883		
		5.2441	Velocity with a Motive Weight of 24 lbs.	

MONDAY, October 29, 1798.

New Conductor, broad bar, and body E a, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 11 in. 6			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.28	2.28	5.05	5.05	5.52	5.52
4	5.71	3.43	13.52	8.47	13.99	8.47
6	14.49	8.78	24.60	11.08	25.12	11.13
8	25.68	11.19	37.21	12.61	37.62	12.50
10	38.00	12.32	50.82	13.61	50.98	13.36
12	51.10	13.10	64.80	13.98	64.87	13.89
14	64.69	13.59	78.77	13.97	78.82	13.95
16	78.58	13.89	92.90	14.13	93.00	14.18
18	92.60	14.02	107.00	14.10	107.29	14.29
20	106.73	14.13	121.49	14.49	121.63	14.34
22	120.98	14.25	135.82	14.33*	136.10	14.47*
24	135.46	14.48*	150.18	14.36	150.39	14.29
26	149.70	14.24	164.52	14.34	164.90	14.51
28	164.09	14.39	.....	.....	.....	.....
		3)43.11		43.03		43.27
		2)14.37		14.3433		14.4233
		7.1850		7.1716		7.2116
		7.1716				
		7.2116				
		3)21.5682				
		7.1894 Velocity with a Motive Weight of 48 lbs.				

MONDAY, October 29, 1798.

New Conductor, broad bar, and body E a, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.51	4.51	7.12	7.12	4.70	4.70	8.59	8.59
4	13.79	9.28	18.30	11.18	14.16	9.46	20.83	12.24
6	26.65	12.86	32.47	14.17	27.19	13.03	35.60	14.77
8	41.62	14.97	48.00	15.53	42.41	15.22	51.30	15.70
10	57.40	15.78	63.92	15.92	58.13	15.72	67.64	16.34
12	73.82	16.42	80.52	16.60	74.53	16.40	84.17	16.53
14	90.39	16.57	97.08	16.56	91.16	16.63	100.93	16.76
16	107.20	16.81	114.21	17.13	107.97	16.81	117.90	16.97
18	124.21	17.01	131.22	17.01	125.00	17.03	135.06	17.16*
20	141.20	16.99*	148.34	17.12*	142.05	17.05*	152.21	17.15
22	158.20	17.00	165.57	17.23	159.33	17.28	.....	.....
		2)33.99		34.35		34.33		34.31
		2)16.995		17.175		17.165		17.155
		8.4975		8.5875		8.5825		8.5775
		8.5875						
		8.5825						
		8.5775						
		4)34.2450						
		8.5612 Velocity with a Motive Weight of 72 lbs.						

MONDAY, October 29, 1798.

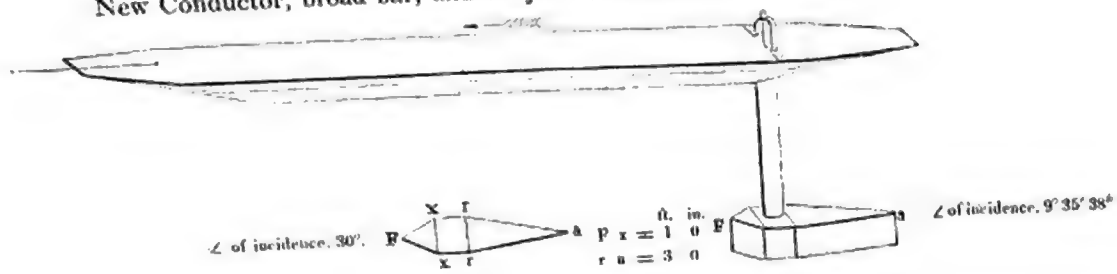
New Conductor, broad bar, and body E a, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.

Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 15	
Sec	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.37	8.37	7.20	7.20	9.98	9.98	9.20	9.20	6.35	6.35
4	21.89	13.52	19.65	12.45	24.39	14.41	22.95	13.75	18.60	12.25
6	38.40	16.51	35.15	15.50	41.43	17.04	39.90	16.95	34.65	16.05
8	56.27	17.87	52.94	17.79	59.42	17.99	57.70	17.80	52.60	17.95
10	74.93	18.66	71.15	18.21	77.65	18.23	76.42	18.72	71.30	18.70
12	94.09	19.16	89.84	18.69	96.90	19.25	95.35	18.93	90.20	18.90
14	113.32	19.23	108.89	19.05	115.90	19.00	114.60	19.25	109.72	19.52
16	132.84	19.52*	128.19	19.30	135.46	19.56*	133.98	19.38*	129.20	19.48
18	152.31	19.47	147.55	19.36*	154.63	19.17	153.50	19.52	148.77	19.57*
20	.....	.....	167.00	19.45	.....	.....	.....	.....	168.30	19.53
		2)38.99		38.81		38.73		38.90		39.10
		2)19.495		19.405		19.365		19.45		19.55
		9.7475		9.7025		9.6825		9.725		9.775
		9.7025								
		9.6825								
		9.7250								
		9.7750								
		5)48.6325								
		9.7265 Velocity with a Motive Weight of 96 lbs.								

New Conductor, broad bar, and body F a, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.5875	5.0354	.....	6.9625	.....	8.3937	9.5192	.....
Correction for Line	3.6058	5.0611	.....	7.0050	.....	8.4634	9.5982	.....
Hutt. Correction, or Regular Series	3.6676	5.0683	6.1243	7.0043	7.7731	8.4634	9.6796	10.742

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.7411	3.2727	7.8021	14.452	23.312	34.453	47.937	63.817	82.135	102.94	126.26	152.14	196.65
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction....	0.3798	1.4949	3.2870	5.705	8.703	12.238	16.275	20.779	25.712	31.06	36.77	42.83	52.68
Friction on 7.825 feet	0.0291	0.1118	0.2453	0.428	0.659	0.938	1.264	1.636	2.053	2.52	3.02	3.57	4.55
Plus and Minus Pressures..	0.3507	1.3831	3.0417	5.277	8.044	11.300	15.011	19.143	23.659	28.54	33.75	39.26	48.18
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.56	0.69	0.82	1.06
Plus Pressure	0.3459	1.3635	2.9966	5.195	7.915	11.108	14.745	18.793	23.209	27.98	33.06	38.44	47.12

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.		lbs.		lbs.		lbs.	
12 and	24	2.0445	24..48	2.1326	48..72	2.1438	72..96	2.2864
	48	2.0923		2.1367		2.2009		
	72	2.1001		2.1667				
	96	2.1239						

10)21.4273

Mean 48 lbs. and 72 lbs. 2.1427

Law of Plus Press. F a|1.9789|1.9420|1.9126|1.8870|1.8589|1.8374|1.8167|1.7919|1.7744|1.7504|1.7328|1.6998|0.0254... *

* Mean decrease.

WEDNESDAY, October 31, 1798.

New Conductor, broad bar, and body F a, immersed six feet.

Thermometer in the Air, 51°;—In the Dock, 52°.—Water in the Dock, 12 feet.—Wind, S. W. Fresh Breeze.

System Four-fold.

Total Weight 51 lbs.			M. Weight 12 lbs.	
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.40	5.40	8.80	8.80
8	17.79	12.39	22.60	13.80
12	33.40	15.61	38.00	15.40
16	49.50	16.10	53.60	15.60
20	64.97	15.47	68.59	14.99
24	79.89	14.92	83.11	14.52
28	94.45	14.56	97.39	14.28
32	108.53	14.08	111.54	14.15
36	122.83	14.30	125.70	14.16
38	129.94	7.11	132.64	6.94
40	137.02	7.08	139.80	7.16
42	144.15	7.13	146.82	7.02
44	151.29	7.14	153.94	7.12
46	158.30	7.01	161.00	7.06
48	165.50	7.20*	168.20	7.20*
50	172.60	7.10	175.40	7.20
		2)14.30		14.40
		2)7.15		7.20
		3.575		3.60
		3.600		
		2)7.175		
		3.5875 Velocity with a Motive Wt. of 12 lbs.		

WEDNESDAY, October 31, 1798.

New Conductor, broad bar, and body F a, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.

Accel. Wt. Chain 12 ft.		A. W. Chain 12 ft.		A. Wt. Chain 12 ft.		A. Wt. Chain 12 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	12.22	12.22	9.00	9.00	13.83	13.83	13.10	13.10
8	30.30	18.08	25.70	16.70	32.34	18.51	31.50	18.40
12	50.10	19.80	45.10	19.40	52.10	19.76	51.30	19.80
16	70.10	20.00	65.04	19.94	71.83	19.73	71.28	19.98
20	89.90	19.80	84.69	19.65	91.54	19.71	91.15	19.87
24	109.75	19.85	104.43	19.74	111.39	19.85	111.08	19.93
26	119.72	9.97	114.40	9.97	121.30	9.91	121.10	10.02
28	129.72	10.00	124.39	9.99	131.36	10.06	131.18	10.08
30	139.75	10.03	134.40	10.01	141.30	9.94*	141.22	10.04*
32	149.82	10.07*	144.49	10.09*	151.37	10.07	151.38	10.16
34	159.92	10.10	154.45	9.96	161.44	10.07	161.55	10.17
36	170.00	10.08	164.55	10.10	.....	.....	.....	.....
		3)30.25		30.15		30.08		30.37
		2)10.0833		10.05		10.0266		10.1233
		5.0416		5.025		5.0133		5.0616
		5.0250						
		5.0133						
		5.0616						
		4)20.1415						
		5.0353 Velocity with a Motive Weight of 24 lbs.						

WEDNESDAY, October 31, 1798.

New Conductor, broad bar, and body F a, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.

Accel. Wt. Chain ft. 8			A. Wt. Chain ft. 12		A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.25	5.25	5.30	5.30	6.10	6.10
4	15.20	9.95	13.90	8.60	15.40	9.30
6	26.45	11.25	24.90	11.00	26.58	11.18
8	38.55	12.10	37.05	12.15	38.95	12.37
10	51.50	12.95	49.87	12.82	51.90	12.95
12	64.55	13.05	63.20	13.33	65.20	13.30
14	78.05	13.50	76.65	13.45	78.78	13.58
16	91.70	13.65	90.43	13.78	92.32	13.54
18	105.42	13.72	104.20	13.77	106.15	13.83
20	119.42	14.00	118.05	13.85	120.00	13.85
22	133.20	13.78	131.98	13.93	133.95	13.95
24	147.20	14.00*	146.00	14.02*	147.80	13.85*
26	161.08	13.88	159.90	13.90	161.70	13.90
		2)27.88		27.92		27.75
		2)13.94		13.96		13.875
		6.9700		6.98		6.9375
		6.9800				
		6.9375				
		3)20.8875				
		6.9625 Velocity with a Motive Weight of 48 lbs.				

WEDNESDAY, October 31, 1798.

New Conductor, broad bar, and body F a, &c.

System Four-fold.

Total Wt. 294 lbs. Motive Weight 72 lbs.				
Accel. Wt. Chain ft. 14			A. Wt. Chain ft. 14	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.45	4.45	8.15	8.15
4	13.85	9.40	19.90	11.75
6	26.60	12.75	34.05	14.15
8	41.40	14.80	49.40	15.35
10	56.98	15.58	65.40	16.00
12	72.90	15.92	81.42	16.02
14	89.10	16.20	97.80	16.38
16	105.55	16.45	114.38	16.58
18	122.00	16.45	130.88	16.50
20	138.75	16.75	147.70	16.82*
22	155.46	16.71*	164.48	16.78
24	172.30	16.84	.....	.....
		2)33.55		33.60
		2)16.775		16.80
		8.3875		8.40
		8.4000		
		2)16.7875		
		8.3937	Velocity with a Motive Weight of 72 lbs.	

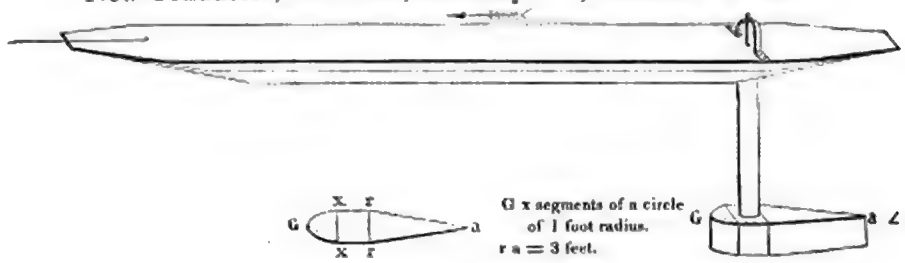
WEDNESDAY, October 31, 1798.

New Conductor, broad bar, and body F a, &c.

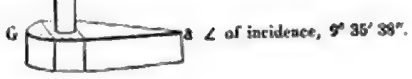
System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 14			A. Wt. Chain ft. 14		A. Wt. Chain ft. 14	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	8.82	8.82	11.50	11.50	9.00	9.00
4	22.25	13.43	26.95	15.45	22.78	13.78
6	38.65	16.40	44.30	17.35	39.60	16.82
8	56.40	17.75	62.30	18.00	57.25	17.65
10	74.58	18.18	80.90	18.60	75.60	18.35
12	93.45	18.87	99.80	18.90	94.42	18.82
14	112.30	18.85	118.78	18.98	113.47	19.05
16	131.32	19.02*	137.80	19.02*	132.49	19.02*
18	150.35	19.03	156.88	19.08	151.55	19.06
		2)38.05		38.10		38.08
		2)19.025		19.05		19.04
		9.5125		9.525		9.52
		9.5250				
		9.5200				
		3)28.5575				
		9.5191 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body G a, immersed six feet.



G x segments of a circle of 1 foot radius.
r a = 3 feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.8175	5.3683	.....	7.3061	.....	8.7583	9.9675	.....
Correction for Line	3.8370	5.3957	.....	7.3507	.....	8.8310	10.0502	.....
Hutt. Correction, or Regular Series	3.8760	5.3250	6.4120	7.3155	8.1030	8.8090	10.0502	11.132

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.6230	2.8317	6.8608	12.854	20.918	31.142	43.597	58.348	75.451	94.957	116.91	141.36	183.61
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction	0.2617	1.0539	2.3457	4.107	6.309	8.927	11.935	15.310	19.028	23.073	27.42	32.05	39.64
Friction on 8.186 feet	0.0301	0.1170	0.2566	0.447	0.690	0.982	1.322	1.711	2.148	2.632	3.16	3.74	4.71
Plus and Minus Pressures	0.2316	0.9369	2.0891	3.660	5.619	7.945	10.613	13.599	16.880	20.441	24.26	28.31	34.93
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure	0.2268	0.9173	2.0440	3.578	5.490	7.753	10.347	13.249	16.430	19.885	23.57	27.49	33.87

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.									
12 and 24	2.0331									
48	2.1324	24..48	2.2418							
72	2.1495	72	2.2299	48..72	2.2099					
96	2.1596	96	2.2288	96	2.2159	72..96	2.2245			

10)21.8254

Mean 12 lbs. and 96 lbs. 2.1825

Law of Plus Press. G a |2.0160|1.9761|1.9462|1.9186|1.8931|1.8722|1.8515|1.8270|1.8115|1.7837|1.7682|1.7424|0.0247|=*

* Mean decrease.

WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body G a, immersed six feet.

Thermometer in the Air, 50°;—In the Dock, 48°.—Water in the Dock, 13 feet.

System Four-fold.

Total Wt. 52 lbs. Motive Wt. 12 lbs.				
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.
4	5.76	5.76	3.50	3.50
8	17.97	12.21	14.04	10.54
12	33.14	15.17	28.43	14.39
16	49.05	15.91	44.40	15.97
20	64.79	15.74	60.00	15.60
24	79.92	15.13	75.35	15.35
28	94.90	14.98	90.35	15.00
32	109.80	14.90	105.15	14.80
36	124.65	14.85	120.15	15.00
38	132.10	7.45	135.02	14.87
40	139.50	7.40	142.62	7.60
42	146.96	7.46	150.02	7.40
44	154.50	7.54	157.52	7.50
46	162.05	7.55	165.12	7.60*
48	169.70	7.65*	172.78	7.66
50	177.33	7.63	.....	.....
		2)15.28		15.26
		2)7.64		7.63
		3.820		3.815
		3.815		
		2)7.635		
		3.8175 Velocity with a Motive Weight of 12 lbs.		

WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body G a, &c.

System Four-fold.

Total Weight 98 lbs.			Motive Weight 24 lbs	
Accel. Wt. Chain 13 ft.			A. Wt. Chain 13 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	8.80	8.80	8.24	8.24
8	26.25	17.45	25.00	16.76
12	47.00	20.75	45.70	20.70
16	68.43	21.43	66.89	21.19
20	89.55	21.12	87.89	21.00
22	100.11†	10.56‡	109.05	21.16
24	121.35	11.24	119.60	10.55
26	132.04	10.69	130.21	10.61
28	142.82	10.78*	140.89	10.68
30	153.60	10.78	151.53	10.64*
32	164.40	10.80	162.25	10.72
34	.....	.....	172.95	10.70
		3)32.36		32.06
		2)10.7866		10.6866
		5.3933		5.3433
		5.3433		
		2)10.7366		
		5.3683	Velocity with a Motive Weight of 24 lbs.	

† Query 110.11?

‡ Query 20.56?

WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body G a, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.

	Accel. Wt. Chain 13 ft.		A. Wt. Chain 13 ft.		A. Wt. Chain 13 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	7.55	7.55	2.86	2.86	2.20	2.20
4	17.00	9.45	9.62	6.76	8.60	6.40
6	28.85	11.85	19.60	9.98	18.48	9.88
8	42.00	13.15	31.90	12.30	30.42	11.94
10	55.86	13.86	45.23	13.33	43.45	13.03
12	70.15	14.29	59.16	13.93	57.40	13.95
14	84.40	14.25	73.30	14.14	71.39	13.99
16	98.95	14.55	87.65	14.35	85.70	14.31
18	113.45	14.50	102.00	14.35	100.05	14.35
20	128.05	14.60	116.17†	14.70	114.69	14.64
22	142.73	14.68*	131.33	14.63*	129.43	14.74
24	157.30	14.57	146.05	14.72	143.94	14.51*
26	172.00	14.70	160.69	14.64	158.55	14.61
28	.....	.....	.....	.....	173.00	14.45
		3)43.95		43.99		43.57
		2)14.65		14.6633		14.5233
		7.3250		7.3316		7.2616
		7.3316				
		7.2616				
		3)21.9182				
		7.3060 Velocity with a Motive Weight of 48 lbs.				

† Query 116.70?

WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body G a, &c.

System Four-fold.

Total Weight 295 lbs. Motive Weight 72 lbs.

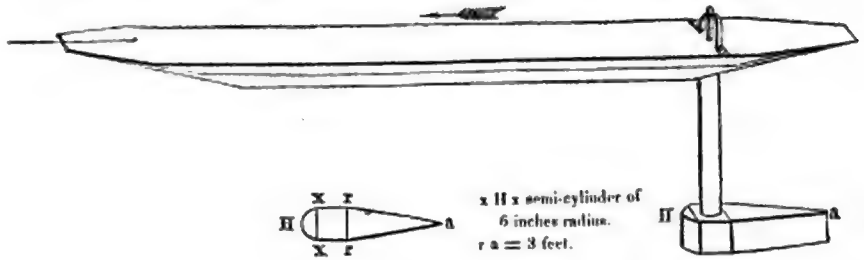
Accel. Wt. Chain 16 ft.			A. Wt. Chain 13 ft.		A. Wt. Chain 13 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.96	5.96	5.50	5.50	5.03	5.03
4	16.70	10.74	15.47	9.97	14.70	9.67
6	30.72	14.02	29.03	13.56	27.95	13.25
8	46.68	15.96	44.35	15.32	43.10	15.15
10	63.32	16.64	60.40	16.05	59.12	16.02
12	80.40	17.08	77.09	16.69	75.80	16.68
14	97.54	17.14	93.95	16.86	92.55	16.75
16	114.94	17.40	111.10	17.15	109.70	17.15
18	132.44	17.50	128.65	17.55	127.15	17.45
20	150.05	17.61*	146.00	17.35*	144.64	17.49*
22	167.52	17.47	163.57	17.57	162.25	17.61
		2)35.08		34.92		35.10
		2)17.54		17.46		17.55
		8.770		8.73		8.775
		8.730				
		8.775				
		3)26.275				
		8.7583 Velocity with a Motive Wt. of 72 lbs.				

System Four-fold.

T. W. 394 lbs.	M. W. 96 lbs.
Accel. Wt. Chain 14 ft. 6 in.	

Sec.	Feet.	Differences.
2	7.45	7.45
4	20.54	13.09
6	37.03	16.49
8	55.39	18.36
10	74.20	18.81
12	93.73	19.53
14	113.67	19.94*
16	133.60	19.93
		2)39.87
		2)19.935
		Velocity with a M. Wt. of 96 lbs. 9.9675

New Conductor, broad bar, and body H a, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	3.7550	.....	6.3366	7.1789	8.0162	8.6436	9.8100	.....
Correction for Line	3.7740	.....	6.3752	7.2227	8.0653	8.7155	9.8914	.....
Hutt. Correction, or Regular Series	3.8316	5.2561	6.3238	7.2104	7.9829	8.6751	9.8914	10.951

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.6311	2.8847	7.0177	13.187	21.509	32.082	44.983	60.282	78.045	98.326	121.18	146.65	190.69
Conductor and Bar.....	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction....	0.2698	1.1069	2.5026	4.440	6.900	9.867	13.321	17.244	21.622	26.442	31.69	37.34	46.72
Friction on 7.743 feet	0.0288	0.1107	0.2427	0.423	0.653	0.928	1.250	1.619	2.032	2.489	2.99	3.54	4.45
Plus and Minus Pressures..	0.2410	0.9962	2.2599	4.017	6.247	8.939	12.071	15.625	19.590	23.953	28.70	33.80	42.27
Minus Pressure	0.0048	0.0196	0.0451	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure.....	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.397	28.01	32.98	41.21

Powers for calculating the Huttonian Correction, or Regular Series.

lbs	lbs.											
12 and	36	2.0955										
	48	2.1357	36..48	2.3049								
	60	2.1192	60	2.1722	48..60	2.0223						
	72	2.1408	72	2.2167	72	2.1582	60..72	2.3515				
	96	2.1581	96	2.2330	96	2.2044	96	2.3029	72..96	2.2730		

15)32.8884

Mean 48 lbs. and 96 lbs. . 2.1926

Law of Plus Press. H a |2.0478|2.0195|1.9978|1.9777|1.9607|1.9450|1.9299|1.9151|1.9061|1.8881|1.8729|1.8599|0.0162|=*

* Mean decrease.

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body H a, immersed six feet.

Thermometer in the Air, 64°;—In the Dock, 57°.—Water in the Dock, 12 feet 9 inches.—Calm.

System Four-fold.

Total Wt. 49 lbs. 11 oz.			Motive Wt. 12 lbs.	
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.
4	7.39	7.39	5.69	5.69
8	19.44	12.05	16.76	11.07
12	33.61	14.17	30.54	13.78
16	48.40	14.79	45.10	14.56
20	63.09	14.69	59.61	14.51
24	77.51	14.42	74.00	14.39
28	92.08	14.57	88.21	14.21
32	106.44	14.36	102.58	14.37
36	121.08	14.64	116.97	14.39
38	128.38	7.30	124.21	7.24
40	135.73	7.35	131.48	7.27
42	143.12	7.39	138.74	7.26
44	150.51	7.39	146.06	7.32
46	157.94	7.43	153.40	7.34
48	165.45	7.51	160.81	7.41
50	172.96	7.51*	168.32	7.51*
		2)7.51		7.51
		3.755		3.755
		3.755		
		2)7.510		
		3.755 Velocity with a Motive Weight of 12 lbs.		

MONDAY, October 8, 1798.

New Conductor, broad bar, and body H a, &c.

Thermometer in the Air, 67°;—In the Dock, 56½°.—Water in the Dock, 11 feet 6 inches.—Calm.

System Four-fold.

Total Weight 147 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.63	2.63	2.40	2.40	3.19	3.19
4	8.64	6.01	8.19	5.79	9.57	6.38
6	17.53	8.89	16.90	8.71	18.68	9.11
8	27.96	10.43	27.40	10.50	29.19	10.51
10	39.62	11.66	39.00	11.60	41.10	11.91
12	51.87	12.25	51.25	12.25	53.19	12.09
14	64.20	12.33	63.60	12.35	65.71	12.52
16	76.59	12.39	76.01	12.41	78.09	12.38
18	88.73	12.14	88.37	12.36	90.53	12.44
20	101.30	12.57	100.99	12.62	103.01	12.48
22	113.76	12.46	113.61	12.62	115.60	12.59
24	126.40	12.64	126.21	12.60	128.15	12.55
26	139.00	12.60*	138.90	12.69*	140.82	12.67*
28	151.61	12.61	151.60	12.70	153.49	12.67
30	164.30	12.69	164.21	12.61	166.31	12.82
		3)37.90		38.00		38.16
		2)12.6333		12.6666		12.72
		6.3166		6.3333		6.36
		6.3333				
		6.3600				
		3)19.0099				
		6.3366 Velocity with a Motive Weight of 36 lbs.				

MONDAY, October 8, 1798.

New Conductor, broad bar, and body H a, &c.

System Four-fold.

Total Weight 195 lbs. 4 oz. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.50	2.50	4.00	4.00	3.10	3.10
4	9.99	7.49	11.67	7.67	10.27	7.17
6	20.02	10.03	22.49	10.82	20.47	10.20
8	32.19	12.17	34.90	12.41	32.58	12.11
10	45.30	13.11	48.27	13.37	45.71	13.13
12	59.08	13.78	62.10	13.83	59.50	13.79
14	73.07	13.99	76.10	14.00	73.39	13.89
16	86.93	13.86	90.23	14.13	87.38	13.99
18	101.10	14.17	104.40	14.17	101.50	14.12
20	115.34	14.24	118.80	14.40	115.86	14.36
22	129.70	14.36*	133.18	14.38*	130.14	14.28*
24	143.98	14.28	147.57	14.39	144.50	14.36
26	158.30	14.32	161.92	14.35	159.00	14.50
		3)42.96		43.12		43.14
		2)14.32		14.3733		14.38
		7.1600		7.1866		7.19
		7.1866				
		7.1900				
		3)21.5366				
		7.1788 Velocity with a Motive Weight of 48 lbs.				

MONDAY, October 8, 1798.

New Conductor, broad bar, and body H a, &c.

System Four-fold.

Total Wt. 245 lbs. Motive Wt. 60 lbs.				
Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.
2	1.42	1.42	0.83	0.83
4	7.92	6.50	6.76	5.93
6	18.29	10.37	16.79	10.03
8	31.22	12.93	29.77	12.98
10	45.79	14.57	44.30	14.53
12	60.97	15.18	59.55	15.25
14	76.58	15.61	75.13	15.58
16	92.39	15.81	90.94	15.81
18	108.07	15.68	106.90	15.96
20	124.13	16.06	122.91	16.01
22	140.09	15.96*	138.82	15.91*
24	156.17	16.08	155.00	16.18
		2)32.04		32.09
		2)16.02		16.045
		8.0100		8.0225
		8.0225		
		2)16.0325		
		8.0162 Velocity with a Motive Weight of 60 lbs.		

TUESDAY, October 9, 1798.

New Conductor, broad bar, and body H a, &c.

System Four-fold.

Total Weight 295 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.16	3.16	5.26	5.26	6.75	6.75
4	11.64	8.48	15.40	10.14	18.05	11.30
6	24.10	12.48	28.95	13.55	32.05	14.00
8	39.09	14.99	44.52	15.57	47.05†	15.40
10	55.98	16.89	60.73	16.21	63.88	16.43
12	71.72	15.74	77.64	16.91	80.30	16.42
14	88.41	16.69	94.57	16.93	97.28	16.98
16	105.40	16.99	111.81	17.24*	114.22	16.94
18	122.61	17.21	129.02	17.21	131.38	17.16*
20	139.90	17.29*	146.42	17.40	148.62	17.24
22	157.18	17.28	.....	.....	166.10	17.48
		2)34.57		3)51.85		51.88
		2)17.285		17.2833		17.2933
		8.6425		8.6416		8.6466
		8.6416				
		8.6466				
		3)25.9307				
		8.6436 Velocity with a Motive Weight of 72 lbs.				

† Query 47.45?

N. B. The first two sets of experiments were made on the 8th of October.

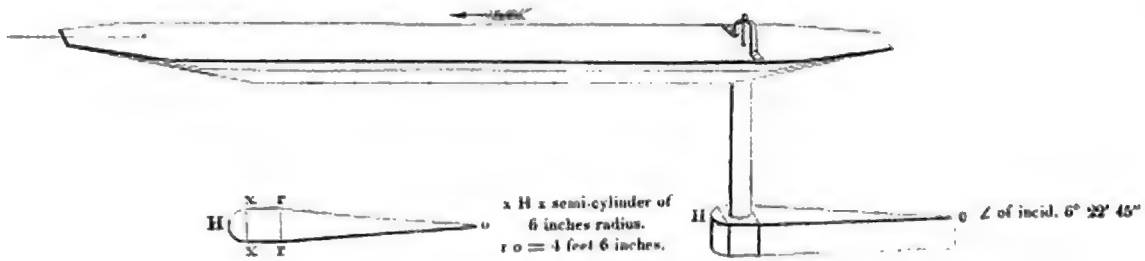
TUESDAY, October 9, 1798.

New Conductor, broad bar, and body H a, &c.

System Four-fold.

Total Weight 393 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 15		A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.00	3.00	5.80	5.80	2.72	2.72
4	7.15	4.15	17.45	11.65	12.45	9.73
6	19.80	12.65	33.25	15.80	27.10	14.65
8	36.05	16.25	51.12	17.87	44.40	17.30
10	54.15	18.10	69.80	18.68	62.80	18.40
12	72.75	18.60	89.00	19.20	81.80	19.00
14	92.12	19.37	108.53	19.53	101.20	19.40
16	111.50	19.38	128.15	19.62*	120.75	19.55
18	131.10	19.60*	.....	.....	140.51	19.76
20	.....	.....	.....	.....	160.15	19.64*
		2) 19.60		19.62		19.64
		9.80		9.81		9.82
		9.81				
		9.82				
		3) 29.43				
		9.81 .. Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body H o, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	3.7066	5.2283	6.3125	7.1683	7.8875	8.5487	9.7212	10.8312
Correction for Line	3.7255	5.2550	6.3510	7.2120	7.9356	8.6196	9.8019	10.9211
Hutt. Correction, or Regular Series	3.8314	5.2566	6.3248	7.2120	7.9850	8.6776	9.8948	10.955

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.6319	2.8867	7.0201	13.188	21.507	32.072	44.962	60.248	77.992	98.257	121.08	146.52	190.51
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction	0.2706	1.1089	2.5050	4.441	6.898	9.857	13.300	17.210	21.569	26.373	31.59	37.21	46.54
Friction on 9.257 feet	0.0344	0.1323	0.2902	0.506	0.780	1.110	1.495	1.935	2.429	2.976	3.58	4.23	5.33
Plus and Minus Pressures	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.397	28.01	32.98	41.21

Minus Pressure none.

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.		lbs.													
12 and 24	2.0151														
36	2.0596	24..36	2.1404												
48	2.0987	48	2.1896	36..48	2.2628										
60	2.1284	60	2.2230	60	2.2933	48..60	2.3338								
72	2.1360	72	2.2201	72	2.2693	72	2.2741	60..72	2.2052						
96	2.1495	96	2.2237	96	2.2601	96	2.2592	96	2.2252	72..96	2.2381				
120	2.1409	120	2.2002	120	2.2211	120	2.2082	120	2.1707	120	2.1585	96..120	2.0640		

28)61.3688

Mean 24 lbs. and 48 lbs. 2.1917

WEDNESDAY, October 17, 1798.

New Conductor, broad bar, and body H o, immersed six feet.

Thermometer in the Air, 62¼°;—In the Dock, 54½°.—Water in the Dock, 13 feet.—Wind, S.W. Fresh Breeze.

System Four-fold.

Total Weight 51 lbs.			Motive Wt. 12 lbs.	
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	6.20	6.20	9.85	9.85
8	18.30	12.10	23.73	13.88
12	33.40	15.10	39.50	15.77
16	48.95	15.55	55.00	15.50
20	64.25	15.30	70.15	15.15
24	79.05	14.80	84.92	14.77
28	93.83	14.78	99.50	14.58
32	108.30	14.47	114.03	14.53
36	122.90	14.60	128.60	14.57
40	137.60	14.70	135.80	7.60†
42	144.88	7.28	143.10	7.30
44	152.25	7.37	155.45‡	7.35
46	159.65	7.40*	157.80	7.35*
48	167.05	7.40	165.18	7.38
50	174.50	7.45	172.68	7.50
		3)22.25		22.23
		2)7.4166		7.41
		3.7083		3.705
		3.7050		
		2)7.4133		
		3.7066	Velocity with a Motive Weight of 12 lbs.	

† Query 7.20?

‡ Query 150.45?

WEDNESDAY, October 17, 1798.

New Conductor, broad bar, and body H o, &c.

System Four-fold.

Total Weight 97 lbs. 12 oz. Motive Weight 24 lbs.						
Accel. Wt. Chain ft. 12 in. 6			A. Wt. Chain ft. 12 in. 6		A. Wt. Chain ft. 12 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	10.35	10.35	8.30	8.30	11.73	11.73
8	28.75	18.40	25.00	16.70	30.37	18.64
12	50.15†	21.43	45.63	20.63	51.30	20.93
16	71.53	21.35	66.83	21.20	72.40	21.10
20	93.30	21.77	87.55	20.72	93.20	20.80
22	102.27	8.97	108.22	20.67	113.80	20.60
24	113.00	10.73	118.52	10.30	124.05	10.25
26	123.40	10.40	128.85	10.33	134.52	10.47
28	133.75	10.35	139.20	10.35	144.87	10.35*
30	144.20	10.45	149.68	10.48*	155.40	10.53
32	154.60	10.40*	160.05	10.37	165.82	10.42
34	164.90	10.30	170.58	10.53	.....	.....
36	175.63	10.73	.....	.....	.....	.....
		3)31.43		31.38		31.30
		2)10.4766		10.46		10.4333
		5.2383		5.23		5.2166
		5.2300				
		5.2166				
		3)15.6849				
		5.2283 Velocity with a Motive Weight of 24 lbs.				

† Query 50.18?

WEDNESDAY, October 17, 1798.

New Conductor, broad bar, and body H o, &c.

System Four-fold.

T. Wt. 146 lbs		M. Wt. 36 lbs.	
Accel. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	3.40	3.40	1.50	1.50
4	10.18	6.78	6.75	5.25
6	19.79	9.61	14.83	8.08
8	31.07	11.28	25.60	10.77
10	43.12	12.05	37.40	11.80
12	55.65	12.53	49.75	12.35
14	68.10	12.45	60.35	12.60
16	80.64	12.54	74.70	12.35
18	93.00	12.36	87.14	12.44
20	105.36	12.36	99.55	12.41
22	117.84	12.48	111.79	12.24
24	120.40	12.56	124.45	12.66
26	142.96	12.56*	136.84	12.39
28	155.55	12.59	149.59	12.75*
30	168.29	12.74	162.12	12.53
32	.....	.....	174.70	12.58
		3)37.89		37.86
		2)12.63		12.62
		6.315		6.31
		6.310		
		2)12.625		
		6.3125 Velocity with a Motive Weight of 36 lbs.		

WEDNESDAY, October 17, 1798.

New Conductor, broad bar, and body H o, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 ft. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.02	6.02	6.00	6.00	6.52	6.52
4	15.86	9.84	15.55	9.55	16.30	9.78
6	27.85	11.99	27.70	12.15	28.58	12.28
8	41.35	13.50	40.95	13.25	42.16	13.58
10	55.22	13.87	54.83	13.88	55.89	13.73
12	69.48	14.26	68.84	14.01	70.05	14.16
14	83.50	14.02	83.00	14.16	84.00	13.95
16	97.71	14.21	97.19	14.19	98.20	14.20
18	111.80	14.09	111.49	14.30	112.38	14.14†
20	126.30	14.50	125.75	14.26	126.62	14.24
22	140.59	14.29*	140.11	14.36*	140.85	14.23*
24	154.94	14.35	154.34	14.23	155.22	14.37
26	169.29	14.35	168.87	14.53	169.54	14.32
		3)42.99		43.12		42.92
		2)14.33		14.3733		14.3066
		7.1650		7.1866		7.1533
		7.1866				
		7.1533				
		3)21.5049				
		7.1683 Velocity with a Motive Weight of 48 lbs.				

† Query 14.18?

WEDNESDAY, October 17, 1798.

New Conductor, broad bar, and body Ho, &c.

System Four-fold.

Total Weight 244 lbs.			Motive Wt. 60 lbs.	
Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.55	2.55	3.80	3.80
4	9.90	7.35	12.55	8.75
6	20.85	10.95	24.90	12.35
8	34.22	13.37	39.20	14.30
10	48.80	14.58	54.10	14.90
12	63.90	15.10	69.40	15.30
14	79.28	15.38	84.95	15.55
16	94.75	15.47	100.55	15.60
18	110.40	15.65	116.20	15.65
20	126.03	15.63	132.05	15.85*
22	141.78	15.75*	147.68	15.63
24	157.65	15.87	.....	.....
		2)31.62		31.48
		2)15.81		15.74
		7.905		7.87
		7.870		
		2)15.775		
		7.8875 Velocity with a Motive Wt. of 60 lbs.		

System Four-fold.

Total Weight 294 lbs.			Motive Wt. 72 lbs.	
Accel. Wt. Chain ft. 13 in. 6			A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.12	4.12	8.22	8.22
4	13.44	9.32	20.78	12.56
6	26.57	13.13	35.35	14.57
8	41.64	15.07	51.27	15.92
10	57.50	15.86	67.44	16.17
12	73.85	16.35	83.89	16.45
14	90.28†	16.38	100.47	16.58
16	107.07	16.84	117.54	17.07
18	123.90	16.83	134.46	16.92
20	141.00	17.10*	151.60	17.14*
22	158.06	17.06	168.69	17.09
		2)34.16		34.23
		2)17.08		17.115
		8.5400		8.5575
		8.5575		
		2)17.0975		
		8.5487 Velocity with a Motive Wt. of 72 lbs.		

† Should be 90.23?

Digitized by Google

WEDNESDAY, October, 17, 1798.

New Conductor, broad bar, and body Ho, &c.

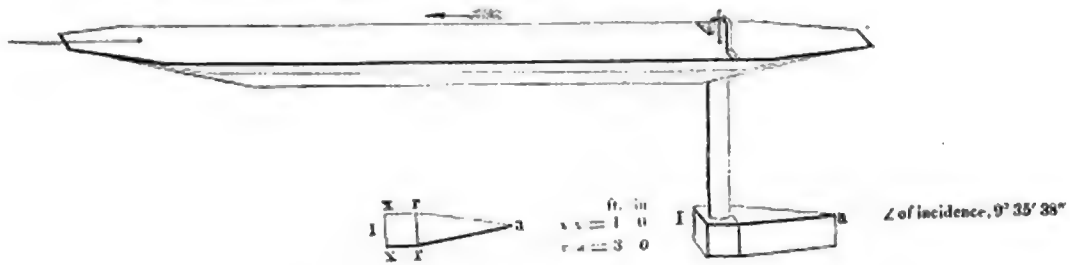
System Four-fold.

Total Weight 393 lbs.			Motive Wt. 96 lbs.	
Accel. Wt. Chain		ft. 13 in. 6	A. Wt. Chain	ft. 15
Sec.	Feet.	Differences.	Feet.	Differences.
2	5.98	5.98	10.33	10.33
4	17.89	11.91	25.48	15.15
6	33.79	15.90	43.02	17.54
8	51.35	17.56	61.78	18.76
10	69.68	18.33	80.79	19.01
12	88.40	18.72	100.02	19.23
14	107.70	19.30	119.51	19.49
16	126.85	19.15	139.08	19.57*
18	146.32	19.47*	158.50	19.42
20	165.63	19.31	.....	.....
		2)38.78		38.99
		2)19.39		19.495
		9.6950		9.7475
		9.7475		
		2)19.4425		
		9.7212 Velocity with a Motive Wt. of 96 lbs.		

System Four-fold.

Total Wt. 489 lbs.			Motive Wt. 120 lbs.	
Accel. Wt. Chain		ft. 14 in. 6	A. Wt. Chain	ft. in. 14 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	9.96	9.96	10.70	10.70
4	25.30	15.34	26.90	16.20
6	44.04	18.74	46.25	19.35
8	64.75	20.71	66.93	20.68
10	85.90	21.15	88.00	21.07
12	107.36	21.46	109.69	21.69
14	129.09	21.73*	131.35	21.66*
16	150.70	21.61	153.00	21.65
		2)43.34		43.31
		2)21.67		21.655
		10.8350		10.8275
		10.8275		
		2)21.6625		
		10.8312 Velocity with a Motive Weight of 120 lbs.		

New Conductor, broad bar, and body I a, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment.....	2.8566	4.0202	.....	5.6173	.....	6.8181	7.8708	8.6562
Correction for Line	2.8712	4.0407	.....	5.6516	.....	6.8772	7.9361	8.7280
Hutt. Correction, or Regular Series	2.8878	4.0288	4.8950	5.6205	6.2564	6.8290	7.8409	8.7280

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3193	5.5853	12.991	23.644	37.625	54.994	75.806	100.10	127.91	159.28	194.25	232.83	298.78
Conductor and Bar	0.3613	1.7778	4.515	8.747	14.609	22.215	31.662	43.04	56.42	71.88	89.49	109.31	143.97
Resistance and Friction....	0.9580	3.8075	8.476	14.897	23.016	32.779	44.144	57.06	71.49	87.40	104.76	123.52	154.81
Friction on 6.958 feet.....	0.0258	0.0994	0.218	0.380	0.586	0.834	1.124	1.45	1.83	2.24	2.69	3.04	4.00
Plus and Minus Pressures..	0.9322	3.7081	8.258	14.517	22.430	31.945	43.020	55.61	69.69†	85.16	102.07	120.48	150.81
Minus Pressure	0.0048	0.0196	0.045	0.082	0.129	0.192	0.266	0.350	0.450	0.556	0.69	0.82	1.06
Plus Pressure.....	0.9274	3.6885	8.213	14.435	22.301	31.753	42.754	55.26	69.24‡	84.604	101.38	119.66	149.75

Powers for calculating the Huttonian Correction, or Regular Series.

lbs. lbs.												
12 and 24	2.0286											
48	2.0471	24..48	2.0660									
72	2.0513	72	2.0659	48..72	2.0658							
96	2.0453	96	2.0537	96	2.0370	72..96	2.0088					
120	2.0711	120	2.0898	120	2.1084	120	2.1435	96..120	2.3460			

15)31.2283

Mean 24 lbs. and 120 lbs. 2.0819

Law of Plus Press. I a |1.9918|1.9743|1.9603|1.9493|1.9381|1.9297|1.9215|1.9148|1.9021|1.8979|1.9053|1.8727|0.0119|=*

† *Query* 69.66? ‡ *Query* 69.21? * Mean decrease.

Digitized by Google

SATURDAY, November 3, 1798.

New Conductor, broad bar, and body I a, immersed six feet.

Thermometer in the Air, 55°;—In the Dock, 52°.—Water in the Dock, 12 feet 6 inches.

System Four-fold.

Total Weight 52 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain 10 ft.			A. Wt. Chain 8 ft.		A. Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.00	4.00	4.85	4.85	4.50	4.50
8	13.74	9.74	14.23	9.38	13.55	9.05
12	26.20	12.46	25.70	11.47	24.95	11.40
16	39.10	12.90	37.40	11.70	36.53	11.58
20	51.49	12.39	48.97	11.57	48.02	11.49
24	63.15	11.66	60.25	11.28	59.25	11.23
28	74.49	11.34	71.40	11.15	70.49	11.24
32	85.57	11.08	82.35	10.95	81.40	10.91
36	96.70	11.13	93.30	10.95	92.40	11.00
40	107.70	11.00	104.20	10.90	103.30	10.90
44	118.75	11.05	115.15	10.95	114.30	11.00
48	129.82	11.07	126.20	11.05	125.39	11.09
52	140.90	11.08	137.30	11.10	136.39	11.00
54	146.49	5.59	142.90	5.60	142.00	5.61
56	152.05	5.56	148.45	5.55	147.57	5.57
58	157.70	5.65	154.04	5.59	153.15	5.58
60	163.34	5.64*	159.65	5.61	158.75	5.60*
62	169.04	5.70	165.35	5.70*	164.39	5.64
64	174.70	5.66	170.97	5.62	170.10	5.71
66	.....	.....	176.77	5.80	.....	.....
		3)17.00		17.12		16.95
		2)5.6666		5.7066		5.65
		2.8333		2.8533		2.825

MONDAY, November 12, 1798.

New Conductor, broad bar, and body I a, &c.

Thermometer in the Air, 45°;—In the Dock, 47°.—Water in the Dock, 13 feet 3 inches.

System Four-fold

Total Weight 52 lbs. Motive Weight 12 lbs.						
Accel. Wt. Chain ft. 6 in. 6			A. Wt. Chain ft. 6 in. 6		A. Wt. Chain ft. 8	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.33	5.33	5.05	5.05	7.60	7.60
8	15.33	10.00	15.32	10.27	18.90	11.30
12	27.15	11.82	27.55	12.23	31.40	12.50
16	39.12	11.97	39.94	12.39	43.45	12.05
20	50.70	11.58	51.70	11.76	55.11	11.66
24	61.95	11.55†	63.03	11.33	66.49	11.38
28	72.89	10.94	74.15	11.12	77.79	11.30
32	83.83	10.94	85.12	10.97	89.09	11.30
36	94.70	10.87	96.12	11.00	100.30	11.21
40	105.60	10.90	107.15	11.03	111.60	11.30
44	116.60	11.00	118.29	11.14	122.97	11.37
48	127.65	11.05	129.53	11.24	134.25	11.28
52	138.51	10.86	140.70	11.17	139.90	5.65
54	144.10	5.59	146.15	5.45	145.59	5.69
56	149.70	5.60	151.90	5.75	151.30	5.71
58	155.30	5.60	157.40	5.50	157.00	5.70
60	160.90	5.60	163.05	5.65	162.75	5.75*
62	166.59	5.69*	168.65	5.60	168.59	5.84
64	172.20	5.61	174.44	5.79*	174.39	5.80
66	177.90	5.70	.....	.....	.....	.....
		3)17.00		2,5.79		3)17.39
		2)5.6666		2.895		5.7966
		2.8333				2.8983
		2.8950				
		2.8983				
		2.8333				
		2.8533				
		2.8250				
		6)17.1382				
		2.8564 Velocity with a Motive Weight of 12 lbs.				

† Query 11.25?

N. B. The sixth set of experiments were made on the 14th of November.

SATURDAY, November 3, and MONDAY, November 12,† 1798.

New Conductor, broad bar, and body I a, &c.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.

Accel. Wt. Chain ft. 8			A. Wt. Chain ft. 8		A. Wt. Chain ft 9		A. Wt. Chain ft. in. 7 6		A. Wt. Chain ft. in. 7 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	7.50	7.50	8.75	8.75	6.60	6.60	7.34	7.34	6.35	6.35
8	22.22‡	12.72	22.05	13.30	20.65	14.05	21.45	14.11	19.90	13.55
12	35.10	14.88	36.98	14.93	37.34	16.69	37.70	16.25	36.27	16.37
16	55.45§	15.35	52.35	15.37	54.00	16.66	54.12	16.42	52.70	16.43
20	65.90	15.45	67.75	15.40	70.05	16.05	69.93	15.81	68.73	16.03
24	81.42	15.52	83.30	15.55	85.79	15.74	85.74	15.81	84.39	15.66
28	97.00	15.58	98.90	15.60	101.54	15.75	101.50	15.76	100.20	15.81
32	112.70	15.70	114.60	15.70	117.24	15.70	117.35	15.85	115.90	15.70
36	128.49	15.79	122.41	7.81	125.15	7.91	125.24	7.89	123.90	8.00
38	136.47	7.98	130.33	7.92	133.04	7.89	133.19	7.95	132.04	8.14
40	144.45	7.98	138.30	7.97	141.00	7.96	141.16	7.97	139.93	7.89
42	152.42	7.97*	146.20	7.90	148.91	7.91	149.16	8.00	148.00	8.07
44	160.40	7.98	154.14	7.94*	156.91	8.00*	157.16	8.00*	155.90	7.90*
46	168.40	8.00	162.05	7.91	164.89	7.98	165.20	8.04	164.05	8.15
48	.....	.....	170.02	7.97	173.62	8.13	173.33	8.13	172.05	8.00
		3)23.95		23.82		24.11		24.17		24.05
		2)7.9833		7.94		8.0366		8.0566		8.0166
		3.9916		3.97		4.0183		4.0283		4.0083

† The first two sets of experiments were made on the 3rd, and the last three on the 12th of November.

‡ Query 20.22? § Query 50.45?

WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body I a, &c.

Thermometer in the Air, 50°;—In the Dock, 48°.—Water in the Dock, 13 feet.

System Four-fold.

Total Weight 98 lbs. Motive Weight 24 lbs.

	Accel. Wt. Chain ft. 8		A. Wt. Chain ft. 8	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.20	4.20	4.80	4.80
8	16.05	11.85	16.65	11.85
12	31.14	15.09	31.58	14.93
16	47.03	15.89	47.30	15.72
20	62.71	15.68	63.04	15.74
24	78.65	15.94	78.80	15.76
28	94.70	16.05	94.70	15.90
32	110.71	16.01	110.65	15.95
36	126.80	16.09	126.70	16.05
38	135.00	8.20	134.85	8.15
40	143.10	8.10	142.93	8.08
42	151.25	8.15*	151.00	8.07
44	159.40	8.15	159.10	8.10*
46	167.50	8.10	167.25	8.15
48	.....	.....	175.35	8.10
		3)24.40		24.35
		2)8.1333		8.1166
		4.0666		4.0583
		4.0583		
		3.9916		
		3.9700		
		4.0183		
		4.0283		
		4.0083		
		7)28.1414		
		4.0202 Velocity with a Motive Weight of 24 lbs.		

SATURDAY, November 3, and MONDAY, November 12,† 1798.

New Conductor, broad bar, and body I a, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.

Accel. Wt. Chain 6 ft.		A. Wt. Chain 6 ft.		A. Wt. Chain 11 ft.		A. Wt. Chain 11 ft.		A. Wt. Chain 11 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	11.25	11.25	9.20	9.20	9.63	9.63	10.04	10.04	11.54	11.54
8	29.78	18.53	26.70	17.50	29.25	19.62	29.61	19.57	31.70	20.16
12	50.60	20.82	47.23	20.53	51.31	22.06	51.50	21.89	54.05	23.35
16	72.20	21.60	68.90	21.67	73.49	22.18	73.54	22.04	76.19	22.14
20	94.10	21.90	90.90	22.00	95.60	22.11	95.60	22.06	98.19	22.00
22	105.15	11.05	113.10	22.10‡	106.70	11.10	106.65	11.05	109.50	11.31
24	116.30	11.15	124.29	11.19	117.99	11.29	117.85	11.20	120.53	11.03
26	127.40	11.10	135.40	11.11	129.22	11.23	129.15	11.30	131.90	11.37
28	138.48	11.08*	146.49	11.09*	140.45	11.23*	140.30	11.15*	133.03	11.13*
30	149.60	11.12	157.74	11.25	151.64	11.19	151.60	11.30	154.29	11.26
32	160.73	11.13	168.79	11.05	162.84	11.20	162.70	11.10	165.45	11.16
		3)33.33		33.39		33.62		33.55		33.55
		2)11.11		11.13		11.2066		11.1833		11.1833
		5.555		5.565		5.6033		5.5916		5.5916

† The first two sets of experiments were made on the 3rd, and the last three on the 12th of November.

‡ Query 22.20?

WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body I a, &c.

Thermometer in the Air, 50°;—In the Dock, 48°.—Water in the Dock, 13 feet.

System Four-fold.

Total Weight 195 lbs.			Motive Wt. 48 lbs.	
Accel. Wt. Chain 8 ft.			A. Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	8.32	8.32	5.60	5.60
8	26.15	17.83	23.10	17.50
12	47.23	21.08	44.05	20.95
16	69.30	22.07	66.30	22.25
20	91.90	22.60	88.70	22.40
22	103.25	11.35	111.50	22.80
24	114.55	11.30	122.95	11.45
26	126.20	11.65	134.33	11.38
28	137.55	11.35	145.75	11.42*
30	149.04	11.49*	157.25	11.50
32	160.40	11.36	168.55	11.30
34	171.82	11.42	.....	.....
		3)34.27		34.22
		2)11.4233		11.4066
		5.7116		5.7033
		5.7033		
		5.5550		
		5.5650		
		5.6033		
		5.5916		
		5.5916		
		7)39.3214		
		5.6174 Velocity with a Motive Weight of 48 lbs.		

SATURDAY, Nov. 3, and MONDAY, Nov. 12, † 1798. WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body I a, &c.

System Four-fold.

T.Wt. 294 lbs.	M.Wt. 72 lbs.	T.Wt. 295 lbs.	
Accel. Wt. Chain ft. 9		A. Wt. Chain ft. 8	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.20	4.20	3.83	3.83
4	12.40	8.20	11.80	7.97
6	23.40	11.00	22.55	10.75
8	35.55	12.15	34.60	12.05
10	48.49	12.94	47.20	12.60
12	61.60	13.11	60.15	12.95
14	74.85	13.25	73.10	12.95
16	88.19	13.34	86.39	13.29
18	101.63	13.44	99.50	13.11
20	115.23	13.60	112.78	13.28
22	128.72	13.49	126.24	13.46
24	142.15	13.43*	139.69	13.45
26	155.80	13.65	153.34	13.65*
28	.....	.....	166.80	13.46
		2)27.08		27.11
		2)13.54		13.555
		6.77		6.7775

† The first set of experiments was made on the 3rd, and the second on the 12th of November.

System Four-fold.

Total Weight 295 lbs.	Motive Wt. 72 lbs.		
Accel. Wt. Chain ft. 9 in. 6		A. Wt. Chain ft. 9 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.
2	7.15	7.15	5.11	5.11
4	17.55	10.40	14.42	9.31
6	29.74	12.19	25.96	11.54
8	42.62	12.88	38.60	12.64
10	55.75	13.13	51.80	13.20
12	68.93	13.18	65.00	13.20
14	82.55	13.62	78.32	13.32
16	95.70	13.15	91.80	13.48
18	109.30	13.60	105.50	13.70
20	122.90	13.60	119.15	13.65
22	136.60	13.70*	132.85	13.70
24	150.30	13.70	146.55	13.70*
26	.....	.....	160.35	13.80
		2)27.40		27.50
		2)13.70		13.75
		6.8500		6.875
		6.8750		
		6.7700		
		6.7775		
		4)27.2725		
		6.8181 Velocity with a Motive Weight of 72 lbs.		

SATURDAY, November 3, and MONDAY, November 12,† 1798.

New Conductor, broad bar, and body I a, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.

	Accel. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.		A. Wt. Chain 10 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.68	3.68	4.85	4.85	5.20	5.20
4	12.75	9.07	14.70	9.85	15.70	10.50
6	25.25	13.50	27.60	12.90	29.04	13.34
8	39.50	14.25	41.95	14.35	43.89	14.85
10	54.39	14.89	56.98	15.03	58.70	14.81
12	69.65	15.26	72.14	15.16	73.74	15.04
14	85.12	15.47	87.60	15.46	88.90	15.16
16	100.70	15.58*	103.15	15.55	104.40	15.50
18	116.40	15.70	118.85	15.70*	119.80	15.40
20	132.00	15.60	134.39	15.54	135.25	15.45
22	.....	.....	149.90	15.51	150.80	15.55*
24	.....	.....	.....	.....	166.43	15.63
		3)46.88		46.75		2)31.18
		2)15.6266		15.5833		15.59
		7.8133		7.7916		7.795

† The first two sets of experiments were made on the 3rd, and the last on the 12th of November.

WEDNESDAY, November 14, 1798.

New Conductor, broad bar, and body I a, &c.

System Four-fold.

Total Weight 395 lbs. Motive Weight 96 lbs.

Accel. Wt. Chain ft. 9 in. 6			A. Wt. Chain ft. 9 in. 6		A. Wt. Chain ft. 9 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.87	6.87	7.00	7.00	4.50	4.50
4	17.50	10.77†	18.39	11.39	13.00	8.50
6	31.15	13.65	32.00	13.61	25.92	12.92
8	45.90	14.75	47.11	15.11	40.58	14.66
10	61.10	15.20	62.40	15.29	55.70	15.12
12	76.45	15.35	77.80	15.40	71.30	15.60
14	92.20	15.75	93.55	15.75	86.80	15.50
16	107.85	15.65	109.35	15.80	102.52	15.72
18	123.78	15.93	125.35	16.00	118.40	15.88
20	139.68	15.90*	141.30	15.95*	134.25	15.85*
22	155.45	15.77	157.25	15.95	150.13	15.88
		2)31.67		31.90		31.73
		2)15.835		15.95		15.865
		7.9175		7.975		7.9325
		7.9750				
		7.9325				
		7.8133				
		7.7916				
		7.7950				
		6)47.2229‡				
		7.8705§ Velocity with a Motive Weight of 96 lbs.				

† Query 10.63? ‡ Query 47.2249? § Query 7.8708?

MONDAY, November 12, 1798.

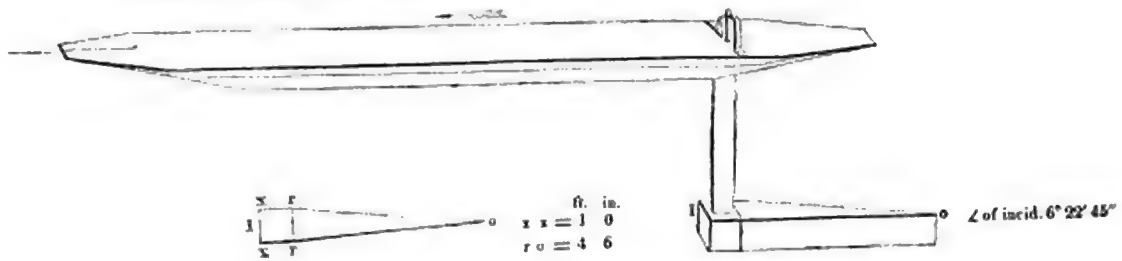
New Conductor, broad bar, and body I a, &c.

System Four-fold.

Total Weight 489 lbs.			Motive Wt. 120 lbs.	
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.
2	8.15	8.15	7.80	7.80
4	21.40	13.25	21.00	13.20
6	37.30	15.90	36.54	15.24
8	53.80	16.50	53.15	16.61
10	70.39	16.49†	70.15	17.00
12	87.65	17.26	86.75	16.60
14	104.64	16.99	103.85	17.10
16	121.80	17.16	121.15	17.30
18	139.05	17.25*	138.60	17.45*
20	156.35	17.30	155.85	17.25
		2)34.55		34.70
		2)17.275		17.35
		8.6375		8.675
		8.6750		
		2)17.3125		
		8.6562 Velocity with a Motive Weight of 120 lbs.		

† Query 16.59?

New Conductor, broad bar, and body I o, immersed six feet.



	Motive Weights.							
	12	24	36	48	60	72	96	120
Velocity per Experiment	2.8475	4.0333	.....	5.6629	.....	6.8766	7.9133	8.6992
Correction for Line	2.8620	4.0539	.....	5.6974	.....	6.9337	7.9790	8.7420
Hutt. Correction, or Regular Series	2.9012	4.0437	4.9106	5.6362	6.2720	6.8444	7.8557	8.7420

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.2988	5.5200	12.869	23.462	37.380	54.697	75.459	99.717	127.51	158.88	193.86	232.47	298.51
Conductor and Bar	0.3613	1.7778	4.515	8.747	14.609	22.215	31.662	43.038	56.42	71.88	89.49	109.31	143.97
Resistance and Friction	0.9375	3.7422	8.354	14.715	22.771	32.482	43.797	56.679	71.09	87.00	104.37	123.16	154.54
Friction on 8.472 feet	0.0314	0.1211	0.265	0.463	0.714	1.016	1.368	1.771	2.22	2.72	3.27	3.87	4.87
Plus Pressure	0.9061	3.6211	8.089	14.252	22.057	31.466	42.429	54.908	68.87	84.28	101.10	119.29	149.67

Minus Pressure none.

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.										
12 and	24	1.9910									
	48	2.0135	24..48	2.0366							
	72	2.0249	72	2.0468	48..72	2.0648					
	96	2.0282	96	2.0463	96	2.0627	72..96	2.0488			
	120	2.0622	120	2.0992	120	2.1403	120	2.2042	96..120	2.4434	

15)31.3127

Mean 24 lbs. and 120 lbs. . 2.0875

Law of Plus Press. I o | 1.9987 | 1.9822 | 1.9688 | 1.9572 | 1.9486 | 1.9392 | 1.9308 | 1.9236 | 1.9165 | 1.9092 | 1.9015 | 1.8941 | 0.0095 | =*

* Mean decrease.

FRIDAY, October 19, 1798.

New Conductor, broad bar, and body I o, immersed six feet.

Thermometer in the Air, 53½°;—In the Dock, 53°.—Water in the Dock, 12 ft. 9 in.—Wind, W.S.W. Moderate.

System Four-fold.

Total Weight 51 lbs.			Motive Weight 12 lbs.	
Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.50	4.50	4.30	4.30
8	16.00	11.50	15.50	11.20
12	29.53	13.53	29.32	13.82
16	42.88	13.35	42.90	15.58
20	54.95	12.07	55.50	12.60
24	67.10	12.15	67.35	11.85
28	78.50	11.40	78.80	11.45
32	89.67	11.17	90.05	11.25
36	100.80	11.13	101.20	11.15
40	111.98	11.18	112.32	11.12
44	123.12	11.14	123.45	11.13
48	134.35	11.23	134.67	11.22
50	140.00	5.65	140.24	5.57
52	145.65	5.65	145.82	5.58
54	151.30	5.65	151.50	5.68
56	157.00	5.70	157.12	5.62
58	162.70	5.70*	162.80	5.68*
60	168.40	5.70	168.50	5.70
		2)11.40		11.38
		2)5.70		5.69
		2.850		2.845
		2.845		
		2)5.695		
		2.8475 Velocity with a Motive Weight of 12 lbs.		

FRIDAY, October 19, 1798.

New Conductor, broad bar, and body I o, &c.

System Four-fold.

Total Weight 97 lbs. 12 oz. Motive Weight 24 lbs.						
	ft. Accel. Wt. Chain 11		ft. A. Wt. Chain 11		ft. A. Wt. Chain 10	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	5.05	5.05	6.02	6.02	6.00	6.00
8	18.72	13.67	20.10	14.08	20.10	14.00
12	35.05	16.33	36.70	16.60	36.65	16.55
16	51.40	16.35	53.20	16.50	53.00	16.35
20	67.50	16.10	69.30	16.10	69.10	16.00
24	83.32	15.82	85.25	15.95	84.97	15.87
28	99.25	15.93	101.23	15.98	100.90	15.93
32	115.15	15.90	117.20	15.97	116.80	15.90
34	123.15	8.00	125.20	8.00	124.90	8.10
36	131.15	8.00	133.28	8.08	132.92	8.02
38	139.03	7.88	141.35	8.07	141.00	8.08
40	147.12	8.09*	149.38	8.03*	149.00	8.00*
42	155.12	8.00	157.53	8.15	157.15	8.15
44	163.12	8.00	165.63	8.10	165.25	8.08
		3)24.09		24.28		24.23
		2)8.03		8.0933		8.0766
		4.0150		4.0466		4.0383
		4.0466				
		4.0383				
		3)12.0999				
		4.0333 Velocity with a Motive Weight of 24 lbs.				

FRIDAY, October 19, 1798.

New Conductor, broad bar, and body I o, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 11			A. Wt. Chain ft. 11		A. Wt. Chain ft. 11	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.50	4.50	4.88	4.88	4.75	4.75
4	12.40	7.90	12.92	8.04	12.67	7.92
6	22.62	10.22	23.25	10.33	22.70	10.03
8	33.80	11.18	34.30	11.05	33.75	11.05
10	45.19	11.39	45.69	11.39	45.10	11.35
12	56.70	11.51	56.97	11.28	56.54	11.44
14	68.05	11.35	98.23	11.26	67.75	11.21
16	79.32	11.27	79.40	11.17	78.90	11.15
18	90.59	11.27	90.69	11.29	90.80	11.90
20	101.90	11.31	101.90	11.21	101.64	10.84
22	113.20	11.30	113.25	11.35	112.80	11.16
24	124.32	11.12	124.55	11.30	124.24†	11.40
26	135.75	11.43*	135.98	11.43*	135.60	11.40*
28	146.90	11.15	147.29	11.31	146.95	11.35
30	158.21	11.31	158.64	11.35	158.25	11.30
32	169.40	11.19	169.98	11.34	169.60	11.35
		4)45.08		45.43		45.40
		2)11.27		11.3575		11.35
		5.6350		5.6787		5.675
		5.6787				
		5.6750				
		3)16.9887				
		5.6629 Velocity with a Motive Weight of 48 lbs.				

† Query 124.20?

FRIDAY, October 19, 1798.

New Conductor, broad bar, and body I o, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12		A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.42	6.42	4.75	4.75	4.30	4.30
4	16.82	10.40	14.05	9.30	13.30	9.00
6	29.05	12.23	26.00	11.95	25.20	11.90
8	42.40	13.35	39.20	13.20	38.08	12.88
10	55.72	13.32	52.60	13.40	51.52	13.44
12	69.30	13.58	66.03	13.43	64.95	13.43
14	82.70	13.40	79.52	13.49	78.48	13.53
16	96.22	13.52	93.15	13.63	92.00	13.52
18	109.78	13.56	106.88	13.73	105.65	13.65
20	123.61	13.83	120.55	13.67	119.38	13.73
22	137.32	13.71*	134.28	13.73*	133.18	13.80*
24	151.13	13.81	147.92	13.64	146.90	13.72
26	164.80	13.67	161.82	13.90	160.70	13.80
		3)41.19		41.27		41.32
		2)13.73		13.7566		13.7733
		6.8650		6.8783		6.8866
		6.8783				
		6.8866				
		3)20.6299				
		6.8766 Velocity with a Motive Weight of 72 lbs.				

FRIDAY, October 19, 1798.

New Conductor, broad bar, and body I o, &c.

System Four-fold.

Total Weight 394 lbs. Motive Weight 96 lbs.

	ft. Accel. Wt. Chain 12		ft. A. Wt. Chain 12		ft. A. Wt. Chain 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.43	5.43	6.05	6.05	5.25	5.25
4	16.12	10.69	17.25	11.20	16.15	10.90
6	30.18	14.06	31.40	14.15	29.28	13.13
8	45.00	14.82	46.30	14.90	44.18	14.90
10	60.35	15.35	61.68	15.38	60.22	16.05†
12	75.80	15.45	77.25	15.27‡	75.80	15.58
14	91.52	15.72	92.92	15.67	91.32	15.52
16	107.25	15.73	108.65	15.73	107.18	15.86
18	123.03	15.78*	144.25§	15.80*	123.00	15.82*
20	138.85	15.82	140.30	15.85	138.82	15.82
22	154.60	15.75	156.22	15.92	154.70	15.88
		3)47.35		47.57		47.52
		2)15.7833		15.8566		15.84
		7.8916		7.9283		7.92
		7.9283				
		7.9200				
		3)23.7399				
		7.9133 Velocity with a Motive Weight of 96 lbs.				

† Query 16.04? ‡ Query 15.57? § Query 124.45?

FRIDAY, October 19, 1798.

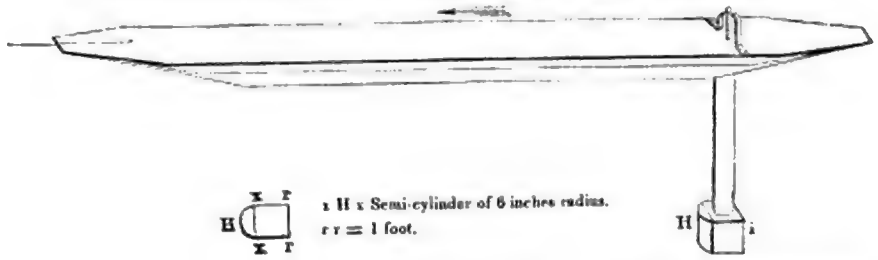
New Conductor, broad bar, and body I o, &c.

System Four-fold.

Total Weight 488 lbs. Motive Weight 120 lbs.

Accel. Wt. Chain ft. 11			A. Wt. Chain ft. 11		A. Wt. Chain ft. 11	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	10.04	10.04	7.63	7.63	8.10	8.10
4	24.49	14.45	20.74	13.11	20.70	12.60
6	40.79	16.30	36.52	15.78	35.82	15.12
8	57.65	16.86	53.32	16.80	52.15	16.33
10	74.80	17.15	70.40	17.08	69.15	17.00
12	92.00	17.20	87.60	17.20	86.45	17.30
14	109.50	17.50	105.00	17.40	103.95	17.50
16	126.90	17.40	122.50	17.50	121.29	17.34
18	144.35	17.45*	139.70	17.20	138.79	17.50*
20	161.79	17.44	157.05	17.35*	156.09	17.30
		2)34.89		17.35		34.80
		2)17.445		8.675		17.40
		8.7225				8.70
		8.6750				
		8.7000				
		3)26.0975				
		8.6992 Velocity with a Motive Weight of 120 lbs.				

New Conductor, broad bar, and body H i, immersed six feet.



x H x Semi-cylinder of 6 inches radius.
r r = 1 foot.

	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment.....	3.4583	4.9071	5.9633	6.8118	.....	8.120	9.2427
Correction for Line	3.4739	4.9321	5.9997	6.8533	.....	8.1874	9.3194
Hutt. Correction, or Regular Series	3.5882	4.9589	5.9922	6.8533	7.6056	8.2812	9.4713

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.7769	3.4303	8.1772	15.145	24.427	36.101	50.229	66.864	86.056	107.85	132.28	159.39	206.01
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction.....	0.4156	1.6525	3.6621	6.398	9.818	13.886	18.567	23.826	29.633	35.97	42.79	50.08	62.04
Friction on 4.785 feet	0.0178	0.0684	0.1500	0.262	0.403	0.574	0.773	1.000	1.255	1.54	1.85	2.18	2.75
Plus and Minus Pressures...	0.3978	1.5841	3.5121	6.136	9.415	13.312	17.794	22.826	28.378	34.43	40.94	47.90	59.29
Plus Pressure by H o	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.40	28.01	32.98	41.21
Minus Pressure	0.1616	0.6075	1.2973	2.201	3.297	4.565	5.989	7.551	9.238	11.03	12.93	14.92	18.08

Powers for calculating the Huttonian Correction, or Regular Series.

	lbs.	lbs.											
12 and	24	1.9810											
	36	2.0126	24..36	2.0693									
	48	2.0421		48	2.1070	36..48	2.1653						
	72	2.0913		72	2.1676		72	2.2295	48..72	2.2796			
	96	2.1084		96	2.1785		96	2.2272		96	2.2551	72..96	2.2215

15)32.1360

Mean 36 lbs. and 48 lbs. 2.1424

FRIDAY, October 12, 1798.

New Conductor, broad bar, and body H i, immersed six feet.

Thermometer in the Air, 50°;—In the Dock, 54°.—Water in the Dock, 12 feet.—Wind, N. W. Light Breeze.

System Four-fold.

Total Wt. 50 lbs. 8 oz.			M. Wt. 12 lbs.	
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.85	4.85	3.29	3.29
8	16.47	11.62	19 50	16.21
12	31.45	14.98	33.83	14.33
16	47.19	15.74	48.18	14.35
20	62.10†	15.21	62.17	13.99
24	76.80	14.40	75.96	13.79
28	90.78	13.98	89.49	13.54
32	104.62	13.84	102.85	13.36
36	118.35	13.73	116.35	13.50
40	131.89	13.54	129.80	13.45
42	138.74	6.85	136.60	6.80
44	145.62	6.88	143.43	6.83
46	152.60	6.98*	150.09	6.66
48	159.45	6.85	157.00	6.91*
50	166.39	6.94	163.80	6.80
52	173.30	6.91	170.83	7.03
		4)27.68		3)20.74
		2)6.92		6.9133
		3.4600		3.4566
		3.4566		
		2)6.9166		
		3.4583	Velocity with a Motive Weight of 12 lbs.	

† Query 62.40?

FRIDAY, October 12, 1798.

New Conductor, broad bar, and body H i, &c.

System Four-fold,

Total Weight 97 lbs. 12 oz. Motive Weight 24 lbs.

	ft. Accel. Wt. Chain 11		ft. A. Wt. Chain 11		ft. A. Wt. Chain 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.12	8.12	7.70	7.70	5.75	5.75
8	23.45	15.33	23.60	15.90	20.32	14.57
12	42.03	18.58	42.80	19.20	39.14	18.82
16	61.10	19.07	62.56	19.76	58.80	19.66
20	80.39	19.29	82.00	19.44	78.23	19.43
24	99.83	19.44	101.38	19.38	97.50	19.27
28	118.90	19.07	120.92	19.54	117.00	19.50
30	128.70	9.80*	130.75	9.83*	126.71	9.71
32	138.43	9.73	140.67	9.92	136.50	9.79*
34	148.35	9.92	150.53	9.86	146.29	9.79
36	158.00	9.65	160.40	9.87	156.25	9.96
38	.....	.....	.....	.....	165.90	9.65
		4)39.10		39.48		39.19
		2)9.775		9.87		9.7975
		4.8875		4.935		4.8987
		4.9350				
		4.8987				
		3)14.7212				
		4.9071 Velocity with a Motive Weight of 24 lbs.				

FRIDAY, October 12, 1798.

New Conductor, broad bar, and body H i, &c.

System Four-fold.

Total Weight 146 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain 15 ft.			A. Wt. Chain 15 ft.		A. Wt. Chain 15 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	9.30	9.30	7.59	7.59	9.17	9.17
8	29.30	20.00	26.70	19.11	28.85	19.68
12	52.49	23.19	49.95	23.15	52.05	23.20
16	75.95	23.46	73.03	23.08	75.45	23.40
20	99.28	23.33	96.23	23.20	98.70	23.25
22	111.19	11.91	107.94	11.71	110.53	11.83
24	122.84	11.65	119.70	11.76	122.23	11.70
26	134.85	12.01*	131.61	11.91*	134.05	11.82*
28	146.75	11.90	143.57	11.96	145.85	11.80
30	158.83	12.08	155.44	11.87	157.80	11.95
32	170.82	11.99	167.32	11.88	169.75	11.95
		4)47.98		47.62		47.52
		2)11.995		11.905		11.88
		5.9975		5.9525		5.94
		5.9525				
		5.9400				
		3)17.8900				
		5.9633 Velocity with a Motive Weight of 36 lbs.				

FRIDAY, October 12, 1798.

New Conductor, broad bar, and body H i, &c.

System Four-fold.

Total Wt. 195 lbs. Motive Wt. 48 lbs.				
Accel. Wt. Chain ft. 16			A. Wt. Chain ft. 15	
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.48	2.48	1.60	1.60
4	9.16	6.68	7.83	6.23
6	19.48	10.32	17.69	9.86
8	31.79	12.31	29.72	12.03
10	45.09	13.30	42.60	12.88
12	58.70	13.61	55.94	13.34
14	72.25	13.55	69.30	13.36
16	85.70	13.45	82.62	13.32
18	99.39	13.69	96.11	13.49
20	112.85	13.46	109.75	13.64
22	126.50	13 65*	123.45	13.70*
24	140.05	13.55	137.10	13.65
26	153.65	13.60	150.74	13.64
28	167.19	13.54	164.40	13.66
		4)54.34		54.65
		2)13.585		13.6625
		6.7925		6.8312
		6.8312		
		2)13.6237		
		6.8118	Velocity with a Motive Weight of 48 lbs.	

FRIDAY, October 12, 1798.

New Conductor, broad bar, and body H i, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.						
Accel. Wt. Chain ft. 10			Accel. Wt. Chain ft. 10		A. Wt. Chain ft. 10	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.36	1.36	2.00	2.00	3.20	3.20
4	7.69	6.33	11.98	9.38†	11.84	8.64
6	17.93	10.24	24.53	12.55	24.25	12.41
8	30.44	12.51	38.87	14.34	38.65	14.40
10	44.60	14.16	53.80	14.93	53.93	15.28
12	59.29	14.69	69.40	15.60	69.60	15.67
14	74.61	15.32	85.00	15.60	85.38	15.78
16	90.03	15.42	101.00	16.00	101.40	16.02
18	105.70	15.67	117.03	16.03	117.70	16.30
20	121.70	16.00	133.19	16.16*	133.98	16.28*
22	137.84	16.14	149.49	16.30	150.28	16.30
24	153.98	16.14*	.....	.....	.....	.....
26	170.24	16.26	.....	.....	.....	.....
		2)32.40		32.46		32.58
		2)16.20		16.23		16.29
		8.100		8.115		8.145
		8.115				
		8.145				
		3)24.360				
		8.120 Velocity with a Motive Weight of 72 lbs.				

† Query 9.98?

FRIDAY, October 12, 1798.

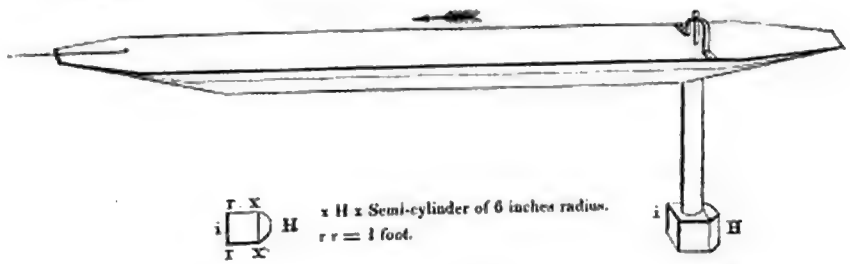
New Conductor, broad bar, and body H i, &c.

System Four-fold.

Total Weight 393 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	6.25	6.25	8.95	8.95	9.50	9.50
4	18.43	12.18	22.85	13.90	23.68	14.18
6	34.24	15.81	39.52	16.67	40.55	16.87
8	51.60	17.36	57.23	17.71	58.15	17.60
10	69.22	17.62	75.30	18.07	76.35	17.20
12	87.21	17.99	93.54	18.24	94.75	18.40
14	105.44	18.63†	112.00	18.46	113.30	18.55
16	124.06	18.62*	130.57	18.57*	131.85	18.55*
18	142.50	18.44	149.09	18.52	150.15	18.30
20	161.07	18.57	167.50	18.41	168.54	18.39
		3)55.63		55.50		55.24
		2)18.5433		18.50		18.4133
		9.2716		9.25		9.2066
		9.2500				
		9.2066				
		3)27.7282				
		9.2427 Velocity with a Motive Weight of 96 lbs.				

† Query 18.23?

New Conductor, broad bar, and body i H, immersed six feet.



	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment	2.7858	3.8554	4.7341	5.4461	6.0022	6.5716	7.5400
Correction for Line	2.8000	3.8751	4.7630	5.4793	6.0388	6.6261	7.6026
Hutt. Correction, or Regular Series	2.7992	3.9056	4.8474	5.4491	6.0658	6.6211	7.6026

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	1.4087	5.9611	13.860	25.223	40.133	58.653	80.841	106.74	136.39	169.83	207.09	248.21	318.47
Conductor and Bar	0.3613	1.7778	4.515	8.747	14.609	22.215	31.662	43.04	56.42	71.88	89.49	109.31	143.97
Resistance and Friction....	1.0474	4.1833	9.345	16.476	25.524	36.438	49.179	63.70	79.97	97.95	117.60	138.90	174.50
Friction on 4.785 feet.....	0.0178	0.0684	0.150	0.262	0.403	0.574	0.773	1.00	1.25	1.54	1.85	2.19	2.75
Plus and Minus Pressures..	1.0296	4.1149	9.195	16.214	25.121	35.864	48.406	62.70	78.72	96.41	115.75	136.71	171.75
Plus Pressure by I o	0.9061	3.6211	8.089	14.252	22.057	31.466	42.429	54.91	68.87	84.28	101.10	119.29	149.67
Minus Pressure	0.1235	0.4938	1.106	1.962	3.064	4.398	5.977	7.79	9.85	12.13	14.65	17.42	22.08

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.															
12 and	24	2.1331														
	36	2.0680	24..36	1.9654												
	48	2.0649		48	2.0010	36..48	2.0534									
	60	2.0940		60	2.0654		60	2.1524	48..60	2.2950						
	72	2.0800		72	2.0479		72	2.0995		72	2.1336	60..72	1.9645			
	96	2.0818		96	2.0570		96	2.0976		96	2.1163		96	2.0410	72..96	2.0927

21)43.7045

Mean 12 lbs. and 96 lbs. 2.0812

THURSDAY, October 11, 1798.

New Conductor, broad bar, and body i H, immersed six feet.

Thermometer in the Air, 50°;—In the Dock, 55°.—Water in the Dock, 13 feet.—Wind, West. Moderate.

System Four-fold.

Total Wt. 51 lbs. Motive Wt. 12 lbs.				
Accel. Wt. Chain 9 ft.			A.Wt. Chain 8 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	6.90	6.90	5.45	5.45
8	18.35	11.45	15.30	9.85
12	31.64	13.25	26.97	11.67
16	44.35	12.71	38.69	12.72
20	56.40	12.05	49.79	11.10
24	67.65	11.25	60.50	10.71
28	78.50	10.85	71.09	10.59
32	89.25	10.75	81.71	10.62
36	99.80	10.55	92.35	10.64
40	110.35	10.55	103.05	10.70
44	120.99	10.64	114.00	10.95
48	131.74	10.75	124.72	10.72
50	136.97	5.23	135.55	10.83
52	142.20	5.23	141.15	5.60
54	147.60	5.40	146.61	5.46
56	152.90	5.30	152.25	5.64
58	158.28	5.38	157.80	5.55
60	163.70	5.42*	163.40	5.60*
62	169.19	5.49	168.99	5.59
64	174.98	5.79	174.53	5.54
		3)16.70		16.73
		2)5.5666		5.5766
		2.7833		2.7883
		2.7883		
		2)5.5716		
		2.7858 Velocity with a Motive Weight of 12 lbs.		

THURSDAY, October 11, 1798.

New Conductor, broad bar, and body i H, &c.

System Four-fold.

Total Weight 97 lbs. 12 oz. Motive Weight 24 lbs.

Accel. Wt. Chain ft. 8			A. Wt. Chain ft. 8		A. Wt. Chain ft. 8	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.80	4.80	8.35	8.35	4.05	4.05
8	16.48	11.68	22.00	13.65	15.10	11.05
12	31.05	14.57	36.92	14.92	29.79	14.69
16	46.11	15.06	51.85	14.93	44.73	14.94
20	61.11	15.00	66.85	15.00	59.60	14.87
24	76.09	14.98	81.62	14.75	74.40	14.80
28	90.95	14.86	96.69	15.07	89.30	14.90
32	106.05	15.10	111.75	15.06	104.23	14.93
36	121.45	15.40	119.39	7.64	119.20	14.97
38	129.11	7.66	127.00	7.61	126.90	7.70
40	136.90	7.79	134.69	7.69*	134.70	7.80
42	144.79	7.89*	142.40	7.71	142.40	7.70*
44	152.43	7.64	149.97	7.57	150.15	7.75
46	160.18	7.75	157.65	7.68	157.90	7.75
48	167.83	7.65	.....	.....	165.65	7.75
		4)30.93		30.65		30.95
		2)7.7325		7.6625		7.7375
		3.8662		3.8312		3.8687
		3.8312				
		3.8687				
		3)11.5661				
		3.8553 Velocity with a Motive Weight of 24 lbs.				

THURSDAY, October 11, 1798.

New Conductor, broad bar, and body i H, &c.

System Four-fold.

Total Wt. 147 lbs.			M. Wt. 36 lbs.	
Accel. Wt. Chain 5 ft.			A. Wt. Chain.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.10	4.10	9.50	9.50
8	17.30	13.20	25.40	15.90
12	33.90	16.60	43.30	17.90
16	51.70	17.80	61.59	18.29
20	69.35	17.65	79.87	18.28
24	87.40	18.05	98.40	18.53
28	105.73	18.33	107.71	9.31
30	114.85	9.12	117.10	9.39
32	124.20	9.35	126.30	9.20
34	133.43	9.23	135.73	9.43
36	142.90	9.47*	145.06	9.33*
38	152.36	9.46	154.65	9.59
40	161.72	9.36	164.25	9.60
		3)28.29		28.52
		2)9.43		9.5066
		4.7150		4.7533
		4.7533		
		2)9.4683		
		4.7341	Velocity with a Motive Weight of 36 lbs.	

THURSDAY, October 11, 1798.

New Conductor, broad bar, and body i H, &c.

System Four-fold.

Total Weight 196 lbs. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 6			A. Wt. Chain ft. 6		A. Wt. Chain ft. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.70	2.70	2.04	2.04	3.45	3.45
4	8.79	6.09	7.51	5.47	10.37	7.92
6	17.16	8.37	15.69	8.18	18.90	8.53
8	26.53	9.37	25.00	9.31	28.48	9.58
10	36.70	10.17	35.35	10.35	38.80	10.32
12	47.25	10.55	45.55	10.20	48.90	10.90†
14	57.80	10.55	56.10	10.55	59.53	10.63
16	68.30	10.50	66.70	10.60	70.03	10.53
18	78.85	10.55	77.30	10.60	80.72	10.69
20	89.50	10.65	87.99	10.69	91.39	10.67
22	100.11	10.61	98.74	10.75	102.00	10.61
24	110.55	10.44	109.73	10.99	112.75	10.75
26	121.10	10.55	120.71	10.98*	123.85	11.10
28	131.61	10.51	131.60	10.89	134.75	10.90
30	142.50	10.89*	142.40	10.80	145.80	11.05*
32	153.29	10.79	.....	.....	156.61	10.81
34	164.18	10.89	.....	.....	167.54	10.93
		3)32.57		32.67		32.79
		2)10.8566		10.89		10.93
		5.4283		5.445		5.465
		5.4450				
		5.4650				
		3)16.3383				
		5.4461 Velocity with a Motive Weight of 48 lbs.				

† Query 10.10?

THURSDAY, October 11, 1798.

New Conductor, broad bar, and body i H, &c.

System Four-fold.

Total Weight 244 lbs. Motive Weight 60 lbs.						
Accel. Wt. Chain ft. 6			A. Wt. Chain ft. 7		A. Wt. Chain ft. 7	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.12	2.12	3.15	3.15	2.05	2.05
4	8.24	6.12	10.27	7.12	8.30	6.25
6	17.40	9.16	19.80	9.53	17.38	9.08
8	27.70	10.30	30.75	10.95	28.05	10.67
10	39.03	11.33	42.53	11.38	39.63	11.58
12	50.89	11.86	54.30	11.77	51.35	11.72
14	62.79	11.90	65.87	11.57	63.50	12.15
16	74.90	12.11	77.65	11.78	75.39	11.89
18	86.89	11.99	89.57	11.92	87.32	11.93
20	98.75	11.86	101.62	12.05	98.97	11.65
22	110.62	11.87	113.80	12.18	110.95	11.98
24	122.72	12.10	125.94	12.14	122.90	11.95
26	134.60	11.88*	138.10	12.16*	134.84	11.94
28	146.64	12.04	150.29	12.19	146.75	11.91*
30	158.50	11.86	162.34	12.05	158.57	11.82
32	.....	.....	.....	.....	170.70	12.13
		3)35.78		36.40		35.86
		2)11.9266		12.1333		11.9533
		5.9633		6.0666		5.9766
		6.0666				
		5.9766				
		3)18.0065				
		6.0022 Velocity with a Motive Weight of 60 lbs.				

THURSDAY, October 11, 1798.

New Conductor, broad bar, and body i H, &c.

System Four-fold.

Total Wt. 294 lbs.			Motive Wt. 72 lbs.	
Accel. Wt. Chain 5 ft.			A. Wt. Chain 10 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
2	4.20	4.20	3.75	3.75
4	12.60	8.40	11.90	8.15
6	23.33	10.73	22.67	10.77
8	35.20	11.87	34.85	12.18
10	47.83	12.63	47.50	12.65
12	60.49	12.66	60.15	12.65
14	73.19	12.70	73.19	13.04
16	85.95	12.76	85.79	12.60
18	98.85	12.90	98.95	13.16
20	111.65	12.80	111.97	13.02
22	124.63	12.98	125.11	13.14
24	137.74	13.11*	138.26	13.15*
26	151.00	13.26	151.14	12.88
28	164.10	13.10	164.50	13.36
		3)39.47		39.39
		2)13.1566		13.13
		6.5783		6.565
		6.5650		
		2)13.1433		
		6.5716	Velocity with a Motive Weight of 72 lbs.	

THURSDAY, October 11, 1798.

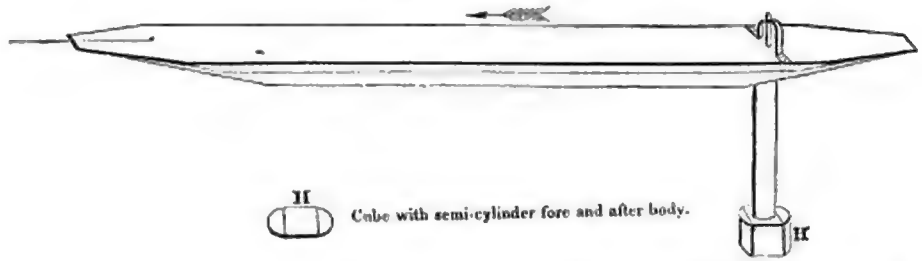
New Conductor, broad bar, and body i H, &c.

System Four-fold.

Total Weight 593 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 8 in. 6			A. Wt. Chain ft. 8 in. 6		A. Wt. Chain ft. 8 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.72	5.72	5.24	5.24	5.05	5.05
4	16.29	10.57	15.50	10.26	15.35	10.30
6	29.45	13.16	28.54	13.04	28.34	12.99
8	43.90	14.45	43.10	14.56	42.95	14.61
10	58.65	14.75	57.85	14.75	57.40	14.45
12	73.47	14.82	72.68	14.83	72.05	14.65
14	88.50	15.03	87.45	14.77	86.98	14.95†
16	103.42	14.92	102.14	14.69	102.23	15.25
18	118.55	15.13	116.98	14.84	117.42	15.19
20	133.60	15.05*	131.60	14.62	132.50	15.08*
22	148.61	15.01	146.60	15.00*	147.55	15.05
24	163.65	15.04	161.70	15.10	162.89	15.34
		3)45.10		2)30.10		3)45.47
		2)15.0333		15.05		15.1566
		7.5166		7.525		7.5783
		7.5250				
		7.5783				
		3)22.6199				
		7.5399 Velocity with a Motive Weight of 96 lbs.				

† Query 14.93?

New Conductor, broad bar, and body H, immersed six feet.



Cube with semi-cylinder fore and after body.

	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment.....	3.5408	5.1183	6.1362	6.9800	7.6994	8.3362	9.4966
Correction for Line	3.5589	5.1444	6.1736	7.0226	7.7464	8.4054	9.5754
Hutt. Correction, or Regular Series	3.6841	5.0652	6.1022	6.9643	7.7161	8.3901	9.5754

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.7019	3.1743	7.6737	14.355	23.332	34.701	48.536	64.911	83.884	105.51	129.84	156.92	203.68
Conductor and Bar	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction	0.3406	1.3965	3.1586	5.608	8.723	12.486	16.874	21.873	27.461	33.63	40.35	47.61	59.71
Friction on 5.57 feet	0.0207	0.0796	4.1746*	0.304	0.469	0.668	0.900	1.164	1.461	1.79	2.15	2.54	3.20
Plus and Minus Pressures..	0.3199	1.3169	2.9840	5.304	8.254	11.818	15.974	20.709	26.000	31.84	38.20	45.07	56.51
Plus Pressure H o	0.2362	0.9766	2.2148	3.935	6.118	8.747	11.805	15.275	19.140	23.397	28.01	32.98	41.21
Minus Pressure	0.0837	0.3403	0.7692	1.369	2.136	3.071	4.169	5.434	6.860	8.443	10.19	12.09	15.30

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
12 and 24	1.8812												
36	1.9945	24..36	2.2232										
48	2.0396	48	2.2272	36..48	2.2327								
60	2.0693	60	2.2385	60	2.2509	48..60	2.2747						
72	2.0848	72	2.2377	72	2.2462	72	2.2558	60..72	2.2330				
96	2.1010	96	2.2313	96	2.2347	96	2.2354	96	2.2173	72..96	2.2075		

21)45.7165

Mean 72 lbs. and 96 lbs. 2.1770

* Query 0.1746?

WEDNESDAY, October 10, 1798.

New Conductor, broad bar, and body H, immersed six feet.

Thermometer in the Air, 63°;—In the Dock, 56°.—
Wind, W. Fresh Breeze.

System Four-fold.

Total Wt. 49 lbs. 11 oz.			Motive Wt. 12 lbs.	
Accel. Wt. Chain 10 ft.			A. Wt. Chain 10 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	4.38	4.38	4.53	4.53
8	15.20	10.82	15.65	11.12
12	29.34	14.14	29.62	14.97
16	44.25	14.91	44.49	14.87
20	58.75	14.50	59.00	14.51
24	72.96	14.21	73.10	14.10
28	86.93	13.97	87.05	13.95
32	100.74	13.81	100.87	13.82
36	114.50	13.76	114.45	13.58
40	129.00	14.50	128.25	13.80
42	135.45	6.45	134.94	6.69
44	142.49	7.04	142.29	7.35
46	149.41	6.92	149.25	6.96
48	156.50	7.09*	156.33	7.08*
50	163.71	7.21	163.40	7.07
52	170.75	7.04	170.40	7.00
		3)21.34		21.15
		2)7.1133		7.05
		3.5567		3.525
		3.5250		
		2)7.0817		
		3.5408 Velocity with a Motive Weight of 12 lbs.		

System Four-fold.

Total Weight 98 lbs.			Motive Wt. 24 lbs.	
Accel. Wt. Chain 13 ft.			A. Wt. Chain 13 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	6.75	6.75	7.94	7.94
8	22.75	16.00	24.74	16.80
12	42.93	19.18	45.20	20.46
16	63.70	20.77	66.10	20.90
20	84.18	20.48	86.60	20.50
24	104.50	20.32	106.79	20.19
26	114.74	10.24	116.90	10.11
28	124.94	10.20	127.05	10.15
30	155.25†	10.31*	137.30	10.25*
32	145.50	10.25	147.55	10.25
34	155.69	10.19	157.75	10.20
36	165.90	10.21	.....	.....
		4)40.96		3)30.70
		2)10.24		10.2333
		5.1200		5.1166
		5.1166		
		2)10.2366		
		5.1183 Velocity with a Motive Weight of 24 lbs.		

† Query 135.25?

WEDNESDAY, October 10, 1798.

New Conductor, broad bar, and body H, &c.

System Four-fold.

Total Weight 147 lbs. Motive Weight 36 lbs.						
Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.38	4.38	5.29	5.29	2.93	2.93
4	12.00	7.62	13.70	8.41	9.29	6.36
6	22.20	10.20	24.19	10.49	18.79	9.50
8	33.60	11.40	35.95	11.76	29.70	10.91
10	45.80	12.20	48.29	12.34	41.65	11.95
12	57.97	12.17	60.55	12.26	53.90	12.25
14	70.19	12.22	72.94	12.39	66.21	12.31
16	81.70	11.51	85.00	12.06	78.42	12.21
18	94.20	12.50	97.21	12.21	90.49	12.07
20	106.35	12.15	109.39	12.18	102.68	12.19
22	118.59	12.24	121.61	12.22	114.84	12.16
24	130.80	12.21*	133.85	12.24*	127.10	12.26*
26	143.15	12.35	146.04	12.19	139.40	12.30
28	155.45	12.30	158.27	12.23	151.60	12.20
30	167.77	12.32	170.65	12.38	163.89	12.29
		4)49.18		49.04		49.05
		2)12.295		12.26		12.2625
		6.1475		6.13		6.1312
		6.1300				
		6.1312				
		3)18.4087				
		6.1362 Velocity with a Motive Weight of 36 lbs.				

WEDNESDAY, October 10, 1798.

New Conductor, broad bar, and body H, &c.

System Four-fold.

Total Weight 195 lbs. Motive Weight 48 lbs.								
Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.00	3.00	2.70	2.70	5.80	5.80	6.00	6.00
4	10.32	7.32	9.51	6.81	15.31	9.51	15.78	9.78
6	21.03	10.71	19.80	10.29	27.30	11.99	27.75	11.97
8	33.73	12.70	32.22	12.42	40.30	13.00	40.93	13.18
10	47.21	13.48	45.60	13.38	54.05	13.75	54.80	13.87
12	61.11	13.90	59.32	13.72	67.98	13.93	68.62	13.82
14	74.89	13.78	72.97	13.65	81.65	13.67	82.44	13.82
16	88.77	13.88	86.90	13.93	95.44	13.79	96.40	13.96
18	102.63	13.86	100.80	13.90	109.34	13.90	110.39	13.99
20	116.60	13.97	114.62	13.82	123.35	14.01	124.40	14.01*
22	130.50	13.90*	128.60	13.98	137.25	13.90*	138.24	13.84
24	144.48	13.98	142.50	13.90*	151.25	14.00	152.27	14.03
26	158.55	14.07	156.50	14.00	165.21	13.96	166.15	13.88
28	.....	.....	170.49	13.99	.....	.....	.....	.....
		3)41.95		41.89		41.86		4)55.76
		2)13.9833		13.9633		13.9533		13.94
		6.9916		6.9816		6.9766		6.97
		6.9816						
		6.9766						
		6.9700						
		4)27.9198						
		6.9799 Velocity with a Motive Weight of 48 lbs.						

WEDNESDAY, October 10, 1798.

New Conductor, broad bar, and body H, &c.

System Four-fold.

Total Weight 244 lbs. Motive Weight 60 lbs.

Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.22	3.22	2.78	2.78	4.77	4.77
4	11.30	8.08	10.65	7.87	14.07	9.30
6	23.25	11.95	22.45	11.80	26.47	12.40
8	37.50	14.25	36.34	13.89	40.70	14.23
10	52.50	15.00	51.15	14.81	55.72	15.02
12	67.79	15.29	66.33	14.18	70.98	15.26
14	83.25	15.46	81.55	15.22	86.15	15.17
16	98.65	15.40	96.77	15.22	101.48	15.33
18	114.20	15.55	112.20	15.43	116.90	15.42
20	129.55	15.35*	127.60	15.40*	132.31	15.41*
22	144.98	15.43	143.05	15.45	147.75	15.44
24	160.32	15.34	158.50	15.45	163.07	15.32
		3)46.12		46.30		46.17
		2)15.3733		15.4333		15.39
		7.6866		7.7166		7.695
		7.7166				
		7.6950				
		3)23.0982				
		7.6994 Velocity with a Motive Weight of 60 lbs.				

WEDNESDAY, October 10, 1798.

New Conductor, broad bar, and body H, &c.

System Four-fold.

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 13			A. Wt. Chain ft. 13		A. Wt. Chain ft. 13 in. 6		A. Wt. Chain ft. 13 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.64	2.64	2.08	2.08	2.81	2.81	4.03	4.03
4	10.79	8.15	9.70	6.62	11.20	8.39	13.30	9.27
6	22.90	12.11	21.30	11.60	23.74	12.54	26.55	13.25
8	37.59	14.69	35.75	14.45	38.60	14.86	41.40	14.85
10	53.09	15.50	51.12	15.37	54.25	15.65	57.35	15.95
12	68.97	15.88	67.08	15.96	70.37	16.12	73.39	16.04
14	85.19	16.22	83.11	16.03	86.30	15.93	89.60	16.21
16	101.58	16.39	99.40	16.29	102.80	16.50	105.97	16.37
18	118.21	16.63	116.01	16.61	119.25	16.45	122.62	16.65
20	134.87	16.66	132.63	16.62	136.10	16.85	139.20	16.58*
22	151.53	16.66*	149.33	16.70*	152.80	16.70*	155.95	16.75
24	168.25	16.72	166.10	16.77	169.30	16.50	.....	.....
		2)33.38		33.47		33.20		33.33
		2)16.69		16.735		16.60		16.665
		8.3450		8.3675		8.30		8.332
		8.3675						
		8.3000						
		8.3320						
		4)33.3445						
		8.3361 Velocity with a Motive Weight of 72 lbs.						

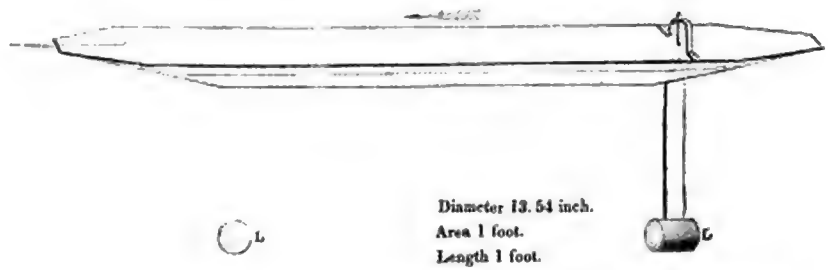
WEDNESDAY, October 10, 1798.

New Conductor, broad bar, and body H, &c.

System Four-fold.

Total Weight 393 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 14 in. 6			A. Wt. Chain ft. 14 in. 6		A. Wt. Chain ft. 14 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.75	4.75	6.60	6.60	7.06	7.06
4	15.98	11.23	19.23	12.63	19.95	12.89
6	31.48	15.50	35.40	16.17	36.42	16.47
8	48.95	17.47	53.19	17.79	54.10	17.68
10	67.25	18.30	71.65	18.46	72.65	18.55
12	85.83	18.58	90.39	18.74	91.50	18.85
14	104.78	18.95	109.32	18.93	110.52	19.02
16	123.75	18.97	128.28	18.96*	119.59	19.07*
18	142.60	18.85*	147.38	19.10	148.54	18.95
20	161.63	19.03	.....	.....	.....	.....
		2)37.88		38.06		38.02
		2)18.94		19.03		19.01
		9.470		9.515		9.505
		9.515				
		9.505				
		3)28.490				
		9.4966 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and cylinder L, immersed six feet.



	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment.....	2.6896	3.7540	4.6412	5.3550	5.9541	6.4037	7.2416
Correction for Line	2.7033	3.7731	4.6567	5.3877	5.9904	6.4569	7.3017
Hutt. Correction, or Regular Series	2.7959	3.8819	4.7034	5.3898	5.9904	6.5305	7.4834

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.3680	5.9142	13.926	25.568	40.962	60.203	83.371	110.54	141.76	177.09	216.57	260.27	341.78
Conductor and Bar	0.3613	1.7778	4.5151	8.7473	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction....	1.0067	4.1364	9.411	16.821	26.353	37.988	51.709	67.50	85.34	105.21	127.08	150.96	197.81
Friction on 3.5448 feet....	0.0132	0.0507	0.111	0.194	0.299	0.425	0.573	0.74	0.93	1.14	1.37	1.62	2.04
Plus and Minus Pressures..	0.9935	4.0857	9.300	16.627	26.054	37.563	51.136	66.76	84.41	104.07	125.71	149.34	195.77

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.											
12 and	24	2.0789										
	36	2.0201	24..36	1.9270								
	48	2.0101		1.9458	36..48	1.9730						
	60	2.0227		1.9822		2.0283	48..60	2.1044				
	72	2.0579		2.0448		2.1207		2.2397	60..72	2.4312		
	96	2.0928		2.0997		2.1805		2.2802		2.3744	72..96	2.3397

21)44.3541

Mean 48 lbs. and 60 lbs. 2.1121

WEDNESDAY, September 27, 1798.

New Conductor, broad bar, and cylinder L, immersed six feet.

Thermometer in the Air, 57¼°;—In the Dock, 59½°.—Water in the Dock, 10 feet.—Wind, W. N. W. Moderate.

System Four-fold.

Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.						
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	2.90	2.90	4.40	4.40	4.25	4.25
8	11.60	8.70	14.00	9.60	13.75	9.50
12	23.10	11.50	25.80	11.80	25.71	11.96
16	34.90	11.80	37.33	11.53	37.30	11.59
20	46.28	11.38	48.50	11.17	48.60	11.30
24	57.10	10.82	59.15	10.65	59.40	10.80
28	67.80	10.70	69.70	10.55	70.15	10 75
32	78.45	10.65	80.12	10.42	80.79	10.64
36	89.00	10.55	90.80	10.68	91.40	10.61
40	99.60	10.60	101.48	10.68	102.00	10.60
44	110.15	10.55	112.20	10.72	112.85	10.85
48	120.75	10.60	122.90	10.70	123.75	10.90
52	131.37	10.62	133.70	10.80	134.60	10.85
54	136.72	5.35	139.00	5.30	140.00	5.40
56	142.10	5.38	144.40	5.40	145.45	5.45
58	147.45	5.35	149.80	5.40	150.85	5.40
60	152.90	5.45*	155.20	5.40*	156.20	5.35*
62	158.22	5.32	160.60	5.40	161.70	5.50
64	163.58	5.36	165.95	5.35	167.00	5.30
66	168.90	5.32	171.30	5.35	172.45	5.45
		4)21.45		21.50		21.60
		2)5.3625		5.375		5.40
		2.6812		2.6875		2.70
		2.6875				
		2.7000				
		3)8.0687				
		2.6895 Velocity with a Motive Wt. of 12 lbs.				

WEDNESDAY, September 27, and FRIDAY, September 29,† 1798.

New Conductor, broad bar, and cylinder L, &c.

Thermometer in the Air, 53°;—In the Dock, 56°.—Water in the Dock, 12 ft. 9 in.—Wind W. N. W. Moderate.

System Four-fold.

	Total Weight 97 lbs. 12 oz. Motive Wt. 24 lbs.						Total Wt. 96 lbs. 12 oz. M. Wt. 24 lbs.			
	ft. Accel. Wt. Chain 9		ft. A. Wt. Chain 9		ft. A. Wt. Chain 9		ft. A. Wt. Chain 7		ft. A. Wt. Chain 7	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	8.20	8.20	5.80	5.80	8.35	8.35	6.87	6.87	6.90	6.90
8	21.90	13.70	18.30	12.50	22.19	13.84	19.70	12.83	19.80	12.90
12	36.90	15.00	33.19	14.89	37.15	14.96	34.40	14.70	34.50	14.70
16	57.84	14.94	48.19	15.00	52.18	15.03	49.25	14.85	49.35	14.85
20	66.65	14.81	63.09	14.90	66.93	14.75	64.09	14.84	64.27	14.92
24	81.50	14.85	78.00	14.91	81.72	14.79	78.95	14.86	79.15	14.88
28	96.43	14.93	92.94	14.94	96.58	14.86	93.90	14.95	94.25	15.10
32	111.30	14.87	108.00	15.06	111.40	14.82	108.82	14.92	109.51	15.26
36	126.35	15.05	123.20	15.20	126.45	15.05	116.25	7.43	117.10	7.59
38	133.83	7.48*	130.72	7.52	133.90	7.45	123.70	7.45	124.65	7.55
40	141.32	7.49	138.32	7.60*	141.40	7.50*	131.20	7.50	132.23	7.58
42	148.82	7.50	145.82	7.50	148.85	7.45	138.65	7.45*	139.74	7.51*
44	156.30	7.48	153.35	7.53	156.35	7.50	146.15	7.50	147.24	7.50
46	.....	.....	160.87	7.52	163.79	7.44	153.67	7.52	154.80	7.56
48	.....	.....	.....	.....	.....	.....	161.21	7.54	162.39	7.59
		4)29.95		30.15		29.89		30.01		30.16
		2)7.4875		7.5375		7.4725		7.5025		7.54
		3.7437		3.7687		3.7362		3.7512		3.77
		3.7687								
		3.7362								
		3.7512								
		3.7700								
		5)18.7698								
		3.7539 Velocity with a Motive Weight of 24 lbs.								

† The first three sets of experiments were made on the 27th, and the last two on the 29th of September.

WEDNESDAY, September 27, and FRIDAY, September 29,† 1798.

New Conductor, broad bar, and cylinder L, &c.

System Four-fold.

Total Wt. 147 lbs. Motive Wt. 36 lbs.					Total Wt. 146 lbs. Motive Wt. 36 lbs.			
Accel. Wt. Chain ft. 9			A. Wt. Chain ft. 9		A. Wt. Chain ft. in. 11 6		A. Wt. Chain ft. in. 11 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	11.30	11.30	15.80	15.80	3.79	3.79	4.08	4.08
8	28.60	17.30	33.30	17.50	10.35	6.56	11.00	6.92
12	46.60	18.00	51.20	17.90	18.71	8.36	19.39	8.39
16	64.78	18.18	69.20	18.00	27.82	9.11	28.55	9.16
20	83.00	18.22	87.35	18.15	37.17	9.35	37.98	9.43
24	101.22	18.22	105.50	18.15	46.50	9.33	47.28	9.30
26	110.33	9.11	114.60	9.10	55.75	9.25	56.60	9.32
28	119.53	9.20	123.63	9.03	64.87	9.12	65.70	9.10
30	128.80	9.27	132.70	9.07	73.96	9.09	74.93	9.23
32	138.12	9.32*	141.82	9.12*	83.04	9.08	84.12	9.19
34	147.30	9.18	150.96	9.14	92.07	9.03	93.22	9.10
36	156.62	9.32	160.10	9.14	101.26	9.19	102.41	9.19
38	165.82	9.20	169.40	9.30	110.34	9.08	111.58	9.17
					119.48	9.14	120.99	9.41
					128.78	9.30	130.28	9.29
					138.00	9.22*	139.69	9.41*
					147.20	9.20	149.09	9.40
					156.50	9.30	158.61	9.52
					165.83	9.33	168.03	9.42
	4)37.02		36.70			37.05		37.75
	2)9.255		9.175			9.2625		9.4375
	4.6275		4.5875			4.6312		4.7187
	4.5875							
	4.6312							
	4.7187							
	4)18.5649							
	4.6412 Velocity with a M. Wt. of 36 lbs.							

† The first two sets of experiments were made on the 27th, and the last two on the 29th of September.

WEDNESDAY, September 27, and FRIDAY, September 29,† 1798.

New Conductor, broad bar, and cylinder L, &c.

System Four-fold.

T. Wt. 196 lbs. 4 oz. M. Wt. 48 lbs.					T.W. 195 lbs. 4 oz. M.W. 48 lbs.			
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.40	4.40	2.85	2.85	3.50	3.50	5.35	5.35
4	11.75	7.35	9.05	6.20	10.12	6.62	13.60	8.25
6	20.90	9.15	17.75	8.70	18.98	8.86	23.51	9.91
8	30.90	10.00	27.60	9.85	28.90	9.92	34.02	10.51
10	41.20	10.30	37.85	10.25	39.00	10.90	44.60	10.58
12	51.45	10.25	48.15	10.30	49.50	10.50	55.11	10.51
14	61.80	10.35	58.65	10.50	59.90	10.40	65.63	10.52
16	72.20	10.40	69.05	10.40	70.40	10.50	76.07	10.44
18	82.70	10.50	79.55	10.50	81.00	10.60	86.65	10.58
20	93.48	10.78	90.08	10.53	91.65	10.65	97.25	10.60
22	104.10	10.62	100.72	10.64	102.25	10.60	107.85	10.60
24	114.85	10.75	111.42	10.70	112.90	10.65	118.65	10.80
26	125.55	10.70	122.18	10.76	123.55	10.65	129.25	10.60*
28	136.38	10.83*	132.90	10.72*	134.30	10.75*	140.00	10.75
30	147.02	10.64	143.60	10.70	144.90	10.60	150.72	10.72
32	157.80	10.78	154.30	10.70	155.56	10.66	161.50	10.78
34	168.42	10.62	155.12	10.82	166.25	10.69	.....	.....
		4)42.87		42.94		42.70		42.85
		2)10.7175		10.735		10.675		10.7125
		5.3587		5.3675		5.3375		5.3562
		5.3675						
		5.3375						
		5.3562						
		4)21.4199						
		5.3550 Velocity with a Motive Weight of 48 lbs.						

† The first three sets of experiments were made on the 27th, and the last one on the 12th of September.

WEDNESDAY, September 27, 1798.

New Conductor, broad bar, and cylinder L, &c.

System Four-fold.

Total Weight 244 lbs. Motive Weight 60 lbs.						
ft. Accel. Wt. Chain 9			ft. A. Wt. Chain 9		ft. A. Wt. Chain 9	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.55	3.55	4.05	4.05	3.83	3.83
4	10.90	7.35	11.75	7.70	11.40	7.57
6	20.95	10.05	21.80	10.05	21.50	10.10
8	31.93	10.98	32.95	11.15	32.55	11.05
10	43.25	11.32	44.33	11.38	43.90	11.35
12	54.67	11.42	55.80	11.47	55.48	11.58
14	66.10	11.43	67.25	11.45	67.00	11.52
16	77.82	11.72	79.00	11.75	78.70	11.70
18	89.30	11.48	90.70	11.70	90.42	11.72
20	101.05	11.75	102.55	11.85	102.30	11.88
22	112.82	11.77	114.45	11.90	114.12	11.82
24	124.70	11.88*	126.30	11.85*	126.10	11.98*
26	136.56	11.86	138.25	11.95	138.10	12.00
28	148.22	11.66	150.12	11.87	150.10	12.00
30	160.12	11.90	162.12	12.00	162.05	11.95
		4)47.30		47.67		47.93
		2)11.825		11.9175		11.9825
		5.9125		5.9587		5.9912
		5.9587				
		5.9912				
		3)17.8624				
		5.9541 Velocity with a Motive Weight of 60 lbs.				

FRIDAY, September 29, 1798.

New Conductor, broad bar, and cylinder L, &c.

System Four-fold.

Total Weight 296 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 10			A. Wt. Chain ft. 10		A. Wt. Chain ft. 10		A. Wt. Chain ft. 10	
Sec.	Feet	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences
2	5.75	5.75	2.90	2.90	4.20	4.20	4.35	4.35
4	15.30	9.55	10.65	7.75	12.70	8.50	13.00	8.65
6	26.45	11.15	21.80	11.15	24.03	11.33	24.38	11.38
8	38.50	12.05	33.96	12.16	36.00	11.97	36.45	12.07
10	50.80	12.30	46.30	12.34	48.45	12.45	48.75	12.30
12	63.30	12.50	58.80	12.50	60.85	12.40	61.22	12.47
14	75.72	12.42	71.30	12.50	73.30	12.45	73.72	12.50
16	88.25	12.53	83.90	12.60	85.83	12.53	86.25	12.53
18	100.85	12.60	96.35	12.45	98.50	12.67	98.70	12.45
20	113.62	12.77	109.05	12.70	111.10	12.60	111.45	12.75
22	126.35	12.73	121.70	12.65	123.73	12.63	124.18	12.73
24	139.30	12.95*	134.55	12.85*	136.50	12.77*	137.00	12.82*
26	152.05	12.75	147.25	12.70	149.45†	12.85	149.75	12.75
28	164.80	12.75	160.10	12.85	162.20	12.85	162.55	12.80
		3)38.45		38.40		38.47		38.37
		2)12.8166		12.80		12.8233		12.79
		6.4083		6.40		6.4116		6.395
		6.4000						
		6.4116						
		6.3950						
		4)25.6149						
		6.4037 Velocity with a Motive Weight of 72 lbs.						

† Query 149.35?

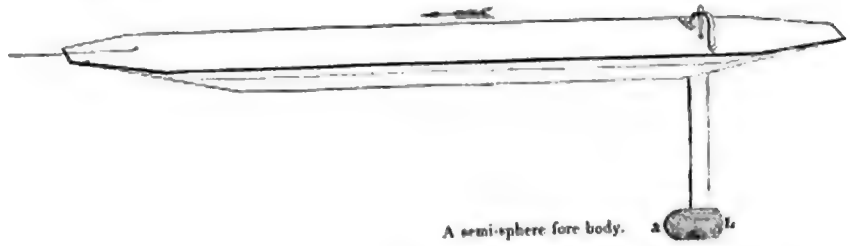
FRIDAY, September 29, 1798.

New Conductor, broad bar, and cylinder L, &c.

System Four-fold.

Total Weight 395 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain none.			A. Wt. Chain 6 ft.		A. Wt. Chain 6 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.80	2.80	6.65	6.65	4.50	4.50
4	10.70	7.90	17.15	10.50	14.15	9.65
6	22.35	11.65	29.90	12.75	26.72	12.57
8	35.30	12.95	43.70	13.80	40.36	13.64
10	49.20	13.90	57.68	13.98	54.50	14.14
12	63.20	14.00	71.98	14.30	68.65	14.15
14	77.45	14.25	86.40	14.42	82.95	14.30
16	91.87	14.42	101.00	14.60	97.60	14.65
18	106.25	14.38	115.55	14.55	112.00	14.40
20	120.70	14.45	129.95	14.40*	126.52	14.52*
22	135.15	14.45*	144.42	14.47	141.10	14.58
24	149.72	14.57	158.90	14.48	155,58	14.48
26	164.12	14.40	.....	.....	.....	.....
		3)43.42		43.35		43.58
		2)14.4733		14.45		14.5266
		7.2366		7.225		7.2633
		7.2250				
		7.2634				
		3)21.7250				
		7.2416 Velocity with a Motive Weight of 96 lbs.				

New Conductor, broad bar, and body a L, immersed six feet.



	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment	3.7962	5.2504	6.3076	7.1470	7.8833	8.5475	9.7187
Correction for Line	3.8156	5.2772	6.3461	7.1906	7.9314	8.6184	9.7994
Hutt. Correction, or Regular Series	3.8531	5.2594	6.3093	7.1791	7.9355	8.6122	9.7994

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights	0.5945	2.7847	6.8715	13.043	21.442	32.187	45.373	61.093	79.422	100.43	124.19	150.76	196.86
Conductor and Bar.....	0.3613	1.7778	4.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.88	89.49	109.31	143.97
Resistance and Friction....	0.2332	1.0069	2.3564	4.296	6.833	9.972	13.711	18.055	22.999	28.55	34.70	41.45	52.89
Friction on 3.5448 feet....	0.0132	0.0507	0.1111	0.194	0.299	0.425	0.573	0.741	0.930	1.14	1.37	1.62	2.04
Plus and Minus Pressures..	0.2200	0.9562	2.2453	4.102	6.534	9.547	13.138	17.314	22.069	27.41	33.33	39.83	50.85

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.													
12 and	24	2.1374	24..36	2.1983										
	36	2.1595	48	2.2404	36..48	2.3027								
	48	2.1878	60	2.2489	60	2.2909	48..60	2.2756						
	60	2.1995	72	2.2398	72	2.2648	72	2.2385	60..72	2.1948				
	72	2.1991	96	2.2398	96	2.2575	96	2.2393	96	2.2223	72..96	2.2401		

21)46.7816

Mean 60 lbs. and 96 lbs. 2.2277

TUESDAY, October 2, 1798.

New Conductor, broad bar, and body a L, immersed six feet.

System Four-fold.

Total Wt. 49 lbs. 12 oz.			Motive Wt. 12 lbs.	
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	2.90	2.90	6.25	6.25
8	12.19	9.29	17.38	11.13
12	24.82	12.63	31.09	13.71
16	38.75	13.93	45.49	14.40
20	53.15	14.40	60.02	14.53
24	67.52	14.37	74.76	14.74
28	82.06	14.54	89.30	14.54
32	96.68	14.62	104.07	14.77
36	111.41	14.73	118.92	14.85
40	126.31	14.90	133.90	14.98
42	133.78	7.47	141.47	7.57
44	141.29	7.51	149.07	7.60*
46	148.90	7.61*	156.65	7.58
48	156.47	7.57	164.19	7.54
50	164.09	7.62	171.88	7.69
52	171.62	7.53	.....	.....
		4)30.33		30.41
		2)7.5825		7.6025
		3.7912		3.8012
		3.8012		
		2)7.5924		
		3.7962	Velocity with a Motive Weight of 12 lbs.	

TUESDAY, October 2, and SATURDAY, October 6, 1798.

New Conductor, broad bar, and body a L, &c.

Thermometer in the Air, 57°;—In the Dock, 56°.—Water in the Dock, 11 feet 9 inches. Calm.

System Four-fold.

Total Wt. 97 lbs. 12 oz. M. Wt. 24 lbs.			Total Wt. 98 lbs. 12 oz. M. Wt. 24 lbs.			
Accel. Wt. Chain ft. 5 in. 6		A. Wt. Chain ft. 9		A. Wt. Chain ft. 9 in. 6		A. Wt. Chain ft. 9 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.04	6.04	5.31	5.31	7.00	7.00	6.80	6.80
8	18.80	12.76	18.50	13.19	20.65	13.65	20.18	13.38
12	35.28	16.48	35.61	17.11	37.76	17.11	37.33	17.15
16	53.76	18.48	54.80	19.19	56.39	18.63	56.00	18.67
20	73.27	19.51	74.80	20.00	75.79	19.40	75.42	19.42
24	93.44	20.17	95.20	20.40	95.71	19.92	95.40	19.98
26	103.75	10.31	105.67	10.47	105.83	10.12	105.56	10.16
28	114.01	10.26	116.06	10.39	116.11	10.28	115.83	10.27
30	124.49	10.48	126.62	10.56	126.39	10.28	126.28	10.45
32	134.93	10.44	137.10	10.48	136.76	10.37	136.72	10.44
34	145.46	10.53*	147.67	10.57*	147.11	10.35*	147.20	10.48*
36	155.90	10.44	158.30	10.63	157.71	10.60	157.70	10.50
38	166.38	10.48	168.74	10.44	168.11	10.40	168.20	10.59
		3)31.45		31.64		31.35		31.57
		2)10.4833		10.5466		10.45		10.5233
		5.2416		5.2733		5.225		5.2616
		5.2733						
		5.2250						
		5.2616						
		4)21.0015						
		5.2504 Velocity with a Motive Weight of 24 lbs.						

TUESDAY, October 2, and SATURDAY, October 6, 1798.

New Conductor, broad bar, and body a L, &c.

System Four-fold.

Total Weight 146 lbs. Motive Wt. 36 lbs.							T. Wt. 147 lbs. M. Wt. 36 lbs.			
Accel. Wt. Chain ft. 12		A. Wt. Chain ft. 12		A. Wt. Chain ft. 12		A. Wt. Chain ft. 10 in. 9		A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.52	1.52	3.76	3.76	4.47	4.47	2.44	2.44	3.00	3.00
4	6.43	4.91	10.79	7.03	11.91	7.44	8.18	5.74	9.11	6.11
6	14.17	7.44	20.07	9.29	21.70	9.79	16.17	7.99	17.01	7.90
8	24.11	10.94	31.02	10.95	32.60	10.90	26.01	9.84	28.30	11.29
10	35.26	11.15	42.58	11.56	44.37	11.77	36.90	10.89	39.73	11.43
12	47.08	11.82	54.72	12.14	56.41	12.04	48.42	11.52	51.56	11.83
14	58.97	11.89	66.89	12.17	68.64	12.23	60.13	11.71	63.65	12.09
16	71.18	12.21	79.20	12.31	80.91	12.27	72.11	11.98	75.83	12.18
18	83.39	12.21	91.53	12.33	93.34	12.43	84.17	12.06	87.90	12.07
20	95.80	12.41	103.97	12.44	105.72	12.38	96.51	12.34	100.30	12.40
22	108.08	12.28	116.39	12.42	118.39	12.67	108.75	12.24	112.70	12.40
24	120.56	12.48	129.06	12.67	130.92	12.53	121.21	12.46	125.33	12.63
26	133.10	12.54	141.51	12.45*	143.50	12.58*	133.73	12.52	137.92	12.59
28	145.83	12.73*	154.29	12.78	156.18	12.68	146.30	12.57*	150.47	12.55*
30	158.42	12.59	166.83	12.54	168.89	12.71	158.86	12.56	163.07	12.60
32	171.11	12.69	.....	.....	.....	.....	171.40	12.54	175.73	12.66
	3)38.01		37.77		37.97		37.67		37.81	
	2)12.67		12.59		12.6566		12.5566		12.6033	
	6.3350		6.295		6.3283		6.2783		6.3016	
	6.2950									
	6.3283									
	6.2783									
	6.3016									
	5)31.5382									
	6.3076 Velocity with a Motive Weight of 36 lbs.									

TUESDAY, October 2, and SATURDAY, October 6, 1798.

New Conductor, broad bar, and body a L, &c.

System Four-fold.

Total Weight 195 lbs. 4 oz. Motive Weight 48 lbs.							T. Wt. 195 lbs. 4 oz. M. Wt. 48 lbs.			
Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.		A. Wt. Chain 12 ft.		A. Wt. Chain 12 ft.		A. Wt. Chain 12 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.04	5.04	3.05	3.05	3.03	3.03	1.77	1.77	4.00	4.00
4	13.55	8.51	9.89	6.84	9.97	6.94	7.72	5.95	11.23	7.23
6	24.26	10.71	19.92	10.03	20.19	10.22	16.73	9.01	21.50	10.27
8	36.80	12.54	31.89	11.97	32.07	11.88	28.22	11.49	33.75	12.25
10	50.00	13.20	44.97	13.08	45.08	13.01	40.70	12.48	46.71	12.96
12	63.77	13.77	58.45	13.48	58.64	13.56	54.21	13.51	60.35	13.64
14	77.51	13.74	72.19	13.74	72.50	13.86	67.74	13.53	73.93	13.58
16	91.54	14.03	86.20	14.01	86.48	13.98	81.59	13.85	88.00	14.07
18	105.74	14.20	100.19	13.99	100.56	14.08	95.63	14.04	101.98	13.98
20	119.90	14.16	114.51	14.32	114.83	14.27	109.80	14.17	116.18	14.20
22	134.22	14.32*	128.75	14.24	129.12	14.29	124.07	14.27	130.45	14.27
24	148.50	14.28	142.95	14.20*	143.47	14.35*	138.37	14.30*	144.81	14.36*
26	162.78	14.28	157.26	14.31	157.71	14.24	152.60	14.23	158.92	14.11
28	.....	.....	171.61	14.35	172.00	14.29	167.02	14.42	173.30	14.38
	3)42.88		42.86		42.88		42.95		42.85	
	2)14.2933		14.2866		14.2933		14.3166		14.2833	
	7.1466		7.1433		7.1466		7.1583		7.1416	
	7.1433									
	7.1466									
	7.1583									
	7.1416									
	5)35.7364									
	7.1473 Velocity with a Motive Weight of 48 lbs.									

TUESDAY, October 2, and SATURDAY, October 6, 1798.

New Conductor, broad bar, and body a L, &c.

System Four-fold.

Total Weight 244 lbs. Motive Weight 60 lbs.

Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12		A. Wt. Chain ft. 12		A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.80	3.80	3.91	3.91	4.76	4.76	2.20	2.20
4	11.96	8.16	11.99	8.08	13.40	8.64	9.20	7.00
6	23.37	11.41	23.37	11.38	25.11	11.71	19.79	10.59
8	36.81	13.44	36.80	13.47	38.87	13.76	32.70	12.91
10	51.37	14.56	51.32	14.52	53.34	14.47	46.93	14.23
12	66.44	15.07	66.19	14.87	68.50	15.16	61.80	14.87
14	81.90	15.46	81.53	15.34	83.84	15.34	77.13	15.33
16	97.40	15.50	96.97	15.44	99.46	15.62	92.60	15.47
18	113.00	15.60	112.76	15.79	115.24	15.78	108.20	15.60
20	128.74	15.74*	128.31	15.55	130.84	15.60*	124.00	15.80
22	144.56	15.82	144.09	15.78*	146.71	15.87	139.83	15.83*
24	160.27	15.71	159.77	15.68	162.46	15.75	155.68	15.85
26	.....	.....	175.46	15.69	.....	.....	171.56	15.88
		3)47.27		47.15		47.22		47.56
		2)15.7566		15.7166		15.74		15.8533
		7.8783		7.8583		7.87		7.9266
		7.8583						
		7.8700						
		7.9266						
		4)31.5332						
		7.8833 Velocity with a Motive Weight of 60 lbs.						

MONDAY, October 1, and SATURDAY, October 6, 1798.

New Conductor, broad bar, and body a L, &c.

Thermometer in the Air, 56°.

System Four-fold.

Total Wt. 296 lbs. Motive Wt. 72 lbs.			Total Wt. 294 lbs. Motive Wt. 72 lbs.			
Accel. Wt. Chain ft. 12			A. Wt. Chain ft. 12		A. Wt. Chain ft. in. 11 6		A. Wt. Chain ft. in. 11 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.43	2.43	10.67	10.67	4.63	4.63	1.40	1.40
4	10.33	7.90	22.71	12.04	13.69	9.06	8.41	7.01
6	22.28	11.95	37.13	14.42	26.47	12.78	19.90	11.49
8	36.72	14.14	52.78	15.65	40.89	14.42	34.10	14.20
10	52.42	15.70	68.96	16.18	56.42	15.53	49.70	15.60
12	68.62	16.20	85.61	16.65	72.49	16.07	65.82	16.12
14	85.20	16.58	102.30	16.69	88.91	16.42	82.30	16.48
16	102.09	16.89	119.40	17.10	105.63	16.72	99.07	16.77
18	119.00	16.91	136.48	17.08*	122.38	16.75	116.08	17.01
20	136.20	17.20*	153.73	17.25	139.33	16.95*	133.11	17.03*
22	153.29	17.09	170.78	17.05	156.21	16.88	150.44	17.33
24	170.54	17.25	.....	.....	173.30	17.09	167.38	16.94
		3)51.54		51.38		50.92		51.30
		2)17.18		17.1266		16.9733		17.10
		8.5900		8.5633		8.4866		8.55
		8.5633						
		8.4866						
		8.5500						
		4)34.1899						
		8.5475 Velocity with a Motive Weight of 72 lbs.						

MONDAY, October 1, and SATURDAY, October 6, 1798.

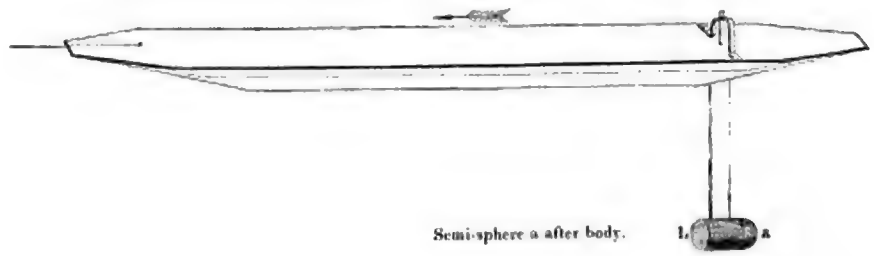
New Conductor, broad bar, and body a L, &c.

System Four-fold.

Total Weight 395 lbs. Motive Weight 96 lbs.

Accel. Wt. Chain 12 ft.			A. Wt. Chain 12 ft.		A. Wt. Chain 12 ft.		A. Wt. Chain 14 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	10.70	10.70	11.51	11.51	11.40	11.40	3.57	3.57
4	24.59	13.89	25.49	13.98	25.61	14.21	13.90	10.33
6	41.38	16.79	42.71	17.22	42.67	17.06	28.69	14.79
8	59.62	18.24	60.83	18.12	60.93	18.26	45.90	17.21
10	78.36	18.74	79.80	18.97	79.78	18.85	64.20	18.30
12	97.56	19.20	99.09	19.29	99.02	19.24	83.25	19.05
14	116.82	19.26	118.10	19.01	118.32	19.30	102.29	19.04
16	136.29	19.47*	137.69	19.59*	137.72	19.40*	121.50	19.21
18	155.60	19.31	157.02	19.33	157.22	19.50	140.90	19.40*
20	.....	.....	.....	.....	.....	.....	160.40	19.50
		2)38.78		38.92		38.90		38.90
		2)19.39		19.46		19.45		19.45
		9.695		9.73		9.725		9.725
		9.730						
		9.725						
		9.725						
		4)38.875						
		9.7187 Velocity with a Motive Weight of 96 lbs.						

New Conductor, broad bar, and body L a, immersed six feet.



	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment.....	2.8275	4.0518	4.8432	5.4991	6.0966	6.6608	7.6475
Correction for Line	2.8439	4.0724	4.8727	5.5326	6.1338	6.7160	7.7463
Hutt. Correction, or Regular Series	2.9057	4.0290	4.8778	5.5866	6.2065	6.7636	7.7463

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	1.2496	5.4345	12.841	23.635	37.938	55.845	77.440	102.79	131.96	165.00	201.95	242.88	313.12
Conductor and Bar.....	0.3613	1.7778	4.515	8.747	14.609	22.215	31.662	43.04	56.42	71.88	89.49	109.31	143.97
Resistance and Friction	0.8883	3.6567	8.326	14.888	23.329	33.630	45.778	59.75	75.54	93.12	112.46	103.57*	169.15
Friction on 3.5448 feet	0.0132	0.0507	0.111	0.194	0.299	0.425	0.573	0.74	0.93	1.14	1.37	1.62	2.04
Plus and Minus Pressures...	0.8751	3.6060	8.215	14.694	23.030	33.205	45.205	59.01	74.61	91.98	111.09	131.95	167.11

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.												
12 and 24	1.9305												
36	2.0402	24..36	2.2601										
48	2.0831	48	2.2621	36..48	2.2650								
60	2.0938	60	2.2371	60	2.2191	48..60	2.1632						
72	2.0851	72	2.1961	72	2.1694	72	2.0918	60..72	2.0106				
96	2.0752	96	2.1561	96	2.1159	96	2.0595	96	2.0142	72..96	2.0157		

21)44.5351

Mean 36 lbs. and 96 lbs. 2.1207

* Query 133.57 ?

Digitized by Google

FRIDAY, October 5, 1798.

New Conductor, broad bar, and body L a, immersed six feet.

Thermometer in the Air, 56°;—In the Dock, 56°.—Water in the Dock, 12 feet.—Wind, East. Strong Breeze.

System Four-fold.

Total Weight 49 lbs. 11 oz. Motive Weight 12 lbs.						
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	4.78	4.78	4.49	4.49	3.90	3.90
8	14.65	9.87	14.03	9.54	13.40	9.50
12	26.85	12.20	25.85	11.82	25.80	12.40
16	39.50	12.65	38.70	12.85	38.72	12.92
20	51.49	11.99	51.39	12.69	50.75	12.03
24	62.94	11.45	61.90	10.51	62.18	11.43
28	74.20	11.26	73.19	11.29	73.15	10.97
32	85.39	11.19	83.97	10.78	84.16	11.01
36	96.64	11.25	94.83	10.86	95.03	10.87
40	107.70	11.06	105.71	10.88	106.00	10.97
44	118.90	11.20	116.75	11.04	116.95	10.95
48	130.17	11.27	128.11	11.36	128.10	11.15
50	135.70	5.53	133.49	5.38	133.70	5.60
52	141.35	5.65*	138.90	5.41	139.35	5.65
54	147.15	5.80	144.65	5.75	145.00	5.65
56	152.69	5.54	150.35	5.70*	150.70	5.70
58	158.33	5.64	156.00	5.65	156.34	5.64*
60	.....	.....	161.58	5.58	161.96	5.62
62	.....	.....	167.35	5.77	167.55	5.59
64	.....	.....	.....	.....	173.23	5.68
		4)22.63		22.70		22.53
		2)5.6575		5.675		5.6325
		2.8287		2.8375		2.8162
		2.8375				
		2.8162				
		3)8.4824				
		2.8275 Velocity with a Motive Weight of 12 lbs.				

FRIDAY, October 5, 1798.

New Conductor, broad bar, and body L a, &c.

System Four-fold.

Total Wt. 97 lbs. 12 oz.			Motive Wt. 24 lbs.	
Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.
4	8.80	8.80	9.10	9.10
8	22.57	13.77	23.60	14.50
12	38.39	15.82	39.40	15.80
16	54.10	15.71	55.32	15.92
20	69.90	15.80	70.98	15.66
24	85.90	16.00	86.45	15.47
28	101.70	15.80	102.35	15.90
32	117.83	16.13	118.60	16.25
34	125.90	8.07	126.74	8.14
36	134.00	8.10	134.92	8.18
38	142.00	8.00*	143.05	8.13*
40	150.09	8.09	151.22	8.17
42	158.05	7.96	159.25	8.03
44	166.25	8.20	167.50	8.25
		4)32.25		32.58
		2)8.0625		8.145
		4.0312		4.0725
		4.0725		
		2)8.1037		
		4.0518 Velocity with a Motive Weight of 24 lbs.		

THURSDAY, October 4, 1798.

New Conductor, broad bar, and body L a, &c.

Thermometer in the Air, 62½°;—In the Dock, 57½°.—Water in the Dock, 12 feet.—Wind, East. Strong Breeze.

System Four-fold.

Total Weight 147 lbs. Motive Weight 36 lbs.

Accel. Wt. Chain 7 ft.			A. Wt. Chain 7 ft.		A. Wt. Chain 7 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	10.60	10.60	4.77	4.77	10.28	10.28
8	27.32	16.72	18.77	14.00	27.03	16.75
12	45.78	18.46	36.65	17.88	45.45	18.02
16	64.09	18.31	55.19	18.54	63.68	18.23
20	82.65	18.56	74.03	18.84	82.36	18.68
24	101.43	18.78	93.08	19.05	100.86	18.50
26	111.08	9.65	112.30	19.22	110.10	9.24
28	120.32	9.24	121.96	9.66	119.51	9.41
30	129.77	9.45	131.60	9.65*	129.00	9.49
32	139.38	9.61*	141.17	9.56	138.48	9.48
34	149.12	9.74	150.90	9.73	148.10	9.62*
36	158.80	9.68	160.60	9.70	157.89	9.79
38	168.58	9.78	.....	.....	167.57	9.68
		4)38.81		38.64		3)29.09
		2)9.7025		9.66		9.6966
		4.8512		4.83		4.8483
		4.8300				
		4.8483				
		3)14.5295				
		4.8432 Velocity with a Motive Weight of 36 lbs.				

THURSDAY, October 4, 1798.

New Conductor, broad bar, and body L a, &c.

System Four-fold.

Total Weight 195 lbs. 4 oz. Motive Weight 48 lbs.

Accel. Wt. Chain 9 ft.			A. Wt. Chain 9 ft.		A. Wt. Chain 9 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	4.52	4.52	3.21	3.21	6.90	6.90
4	11.76	7.24	9.63	6.42	14.75	7.85
6	19.97	8.21	18.20	8.57	24.00	9.25
8	30.60	10.63	27.93	9.73	34.23	10.23
10	40.67	10.07	38.19	10.26	44.77	10.54
12	51.70	11.03	48.85	10.66	55.60	10.83
14	61.76	10.06	59.54	10.69	66.36	10.76
16	73.43	11.67	70.45	10.91	77.21	10.85
18	83.75	10.32	81.27	10.82	88.10	10.89
20	94.81	11.06	92.17	10.90	98.94	10.84
22	105.68	10.87	103.14	10.97	109.90	10.96
24	116.54	10.86	114.32	11.18	120.76	10.86
26	127.35	10.81*	125.44	11.12	131.62	10.86*
28	138.29	10.94	136.67	11.23*	142.50	10.88
30	149.29	11.00	147.80	11.13	153.47	10.97
32	160.20	10.91	159.01	11.21	164.50	11.03
34	.....	.....	170.02	11.01	.....	.....
		4)43.66		44.58		43.74
		2)10.915		11.145		10.935
		5.4575		5.5725		5.4675
		5.5725				
		5.4675				
		3)16.4975				
		5.4992 Velocity with a Motive Weight of 48 lbs.				

THURSDAY, October 4, 1798.

New Conductor, broad bar, and body L a, &c.

System Four-fold.

Total Weight 244 lbs. Motive Weight 60 lbs.

Accel. Wt. Chain ft. 9			A. Wt. Chain ft. 9		A. Wt. Chain ft. 9	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	1.48	1.48	4.48	4.48	5.39	5.39
4	7.00	5.52	12.25	7.77	14.00	8.61
6	15.58	8.58	22.40	10.15	24.50	10.51
8	25.93	10.35	33.59	11.19	35.75	11.25
10	37.18	11.25	45.25	11.66	47.50	11.75
12	48.78	11.60	56.91	11.66	59.43	11.93
14	60.47	11.69	68.51	11.60	71.67	12.24
16	72.40	11.93	80.40	11.89	83.28	11.61
18	84.47	12.07	92.34	11.94	95.72	12.44
20	96.40	11.93	104.54	12.20	108.01	12.29
22	108.44	12.04	116.65	12.11	120.10	12.09
24	120.48	12.04	128.70	12.05	132.29	12.19*
26	132.53	12.05	140.80	12.10*	144.62	12.33
28	144.70	12.17*	153.08	12.28	156.74	12.12
30	156.90	12.20	165.19	12.11	.....	.....
32	169.14	12.24	.....	.....	.....	.....
		3)36.61		36.49		36.64
		2)12.2033		12.1633		12.2133
		6.1016		6.0816		6.1066
		6.0816				
		6.1066				
		3)18.2898				
		6.0966 Velocity with a Motive Weight of 60 lbs.				

THURSDAY, October 4, 1798.

New Conductor, broad bar, and body L a, &c.

System Four-fold

Total Weight 294 lbs. Motive Weight 72 lbs.

Accel. Wt. Chain ft. 6 in. 6			A. Wt. Chain ft. 6 in. 6		A. Wt. Chain ft. 6 in. 6		A. Wt. Chain ft. 6 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	2.92	2.92	5.80	5.80	6.06	6.06	6.20	6.20
4	10.32	7.40	12.25†	9.45	15.72	9.66	15.82	9.62
6	20.95	10.63	26.99	11.74	27.52	11.80	27.60	11.78
8	33.12	12.17	39.57	12.58	40.09	12.57	40.12	12.52
10	45.80	12.68	52.51	12.94	53.10	13.01	53.01	12.89
12	58.63	12.83	65.48	12.97	66.00	12.90	65.97	12.96
14	71.88	13.25	78.47	12.99	79.19	13.19	79.10	13.13
16	85.11	13.23	91.54	13.07	92.40	13.21	92.28	13.18
18	98.64	13.53	104.88	13.34	105.77	13.37*	105.76	13.48
20	111.96	13.32*	118.21	13.33	119.05	13.28	119.80‡	13.42*
22	125.31	13.35	131.63	13.42*	132.36	13.31	132.53	13.35
24	138.61	13.30	144.80	13.17	.....	.....	145.83	13.30
26	.....	.....	158.07	13.27	.....	.....	.....	.....
		3)39.97		39.86		39.96		40.07
		2)13.3233		13.2866		13.32		13.3566
		6.6616		6.6433		6.66		6.6783
		6.6433						
		6.6600						
		6.6783						
		4)26.6432						
		6.6608 Velocity with a Motive Weight of 72 lbs.						

† Query 15.25?

‡ Query 119.18?

THURSDAY, October 4, 1798.

New Conductor, broad bar, and body L a, &c.

System Four-fold.

	lbs.		lbs.
T. W.	395	M. W.	96
Accel. Wt. Chain		ft. 6	in. 6

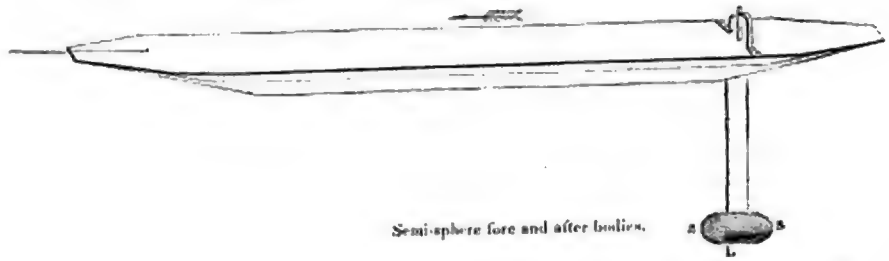
Sec.	Feet.	Differences.
2	4.42	4.42
4	14.23	9.81
6	27.33	13.10
8	41.86	14.53
10	56.72	14.86
12	71.60	14.88
14	86.99	15.39
16	102.03	15.04
18	117.20	15.17
20	132.22	15.02
22	147.46	15.24*
24	162.81	15.35

2)30.59

2)15.295

7.6475 Velocity with a Motive Weight of 96 lbs

New Conductor, broad bar, and body a L a, immersed six feet.



	Motive Weights.						
	12	24	36	48	60	72	96
Velocity per Experiment.....	3.8900	5.4494	6.4066	7.2422	7.9655	.....	9.8916
Correction for Line	3.9098	5.4772	6.4457	7.2864	8.0141	.....	9.9737
Hutt. Correction, or Regular Series	4.0092	5.4327	6.4894	7.3616	8.1181	8.7935	8.9737

	Feet per Second.												
	1	2	3	4	5	6	7	8	9	10	11	12	13.527
Motive Weights.....	0.5052	2.4559	6.1932	11.938	19.861	30.104	42.790	58.028	75.916	96.541	119.99	146.33	192.39
Conductor and Bar	0.3613	1.7778	1.5151	8.747	14.609	22.215	31.662	43.038	56.423	71.884	89.49	109.31	143.97
Resistance and Friction.....	0.1439	0.6781	1.6781	3.191	5.252	7.889	11.128	14.990	19.493	24.657	30.50	37.02	48.42
Friction on 3.5448 feet.....	0.0132	0.0507	0.1111	0.194	0.299	0.425	0.573	0.741	0.930	1.140	1.37	1.62	2.04
Plus and Minus Pressures ..	0.1307	0.6274	1.5670	2.997	4.953	7.464	10.555	14.249	18.563	23.517	29.13	35.40	46.38

Powers for calculating the Huttonian Correction, or Regular Series.

lbs.	lbs.											
12 and 24	2.0562	24..36	2.4903									
36	2.1975	48	2.4286	36..48	2.3466							
48	2.2269	60	2.4074	60	2.3455	48..60	2.3441					
60	2.2424	96	2.3123	96	2.2459	96	2.2066	60..96	2.1469			

15)34.2183

Mean 24 lbs. and 96 lbs.. 2.2812

SATURDAY, September 29, 1798.

New Conductor, broad bar, and body a L a, immersed six feet.

Thermometer in the Air, 53°;—In the Dock, 56°.—Water in the Dock, 12 ft. 9 in.—Wind, W.N.W. Moderate.

System Four-fold.

Total Weight 49 lbs. 12 oz. Motive Weight 12 lbs.

Accel. Wt. Chain 6 ft.			A. Wt. Chain 6 ft.		A. Wt. Chain 6 ft.		A. Wt. Chain 6 ft.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	3.75	3.75	4.65	4.65	6.37	6.37	5.40	5.40
8	13.07	9.32	14.45	9.80	17.15	10.78	15.82	10.42
12	25.73	12.66	27.30	12.85	30.29	13.04	28.70	12.88
16	39.60	13.87	41.22	13.92	44.60	14.31	42.73	14.03
20	54.20	14.60	55.75	14.53	59.03	14.43	57.09	14.36
24	68.82	14.62	70.55	14.80	73.85	14.82	71.74	14.65
28	83.62	14.80	85.45	14.90	88.70	14.85	86.50	14.76
32	98.55	14.93	100.50	15.05	103.75	15.05	101.40	14.90
36	113.70	15.15	115.62	15.12	118.94	15.19	116.50	15.10
38	121.37	7.67	123.11	7.49	126.55	7.61	124.11	7.61
40	128.98	7.61	130.89	7.78	134.15	7.60	131.85	7.74
42	136.63	7.65	138.49	7.60	141.93	7.78*	139.55	7.70
44	144.33	7.70*	146.28	7.79*	149.60	7.67	147.30	7.75*
46	152.20	7.87	154.08	7.80	157.43	7.83	155.10	7.80
48	159.87	7.67	161.79	7.71	165.20	7.77	162.85	7.75
50	167.72	7.85	169.60	7.81	.....	.....	170.78	7.93
		4)31.09		31.11		31.05		31.23
		2)7.7725		7.7775		7.7625		7.8075
		3.8862		3.8887		3.8812		3.9037
		3.8887						
		3.8812						
		3.9037						
		4)15.5598						
		3.8899 Velocity with a Motive Weight of 12 lbs.						

SATURDAY, September 29, 1798.

New Conductor, broad bar, and body a L a, &c.

System Four-fold.

Total Weight 96 lbs. 12 oz. Motive Weight 24 lbs.

Accel. Wt. Chain 6 ft.			A. Wt. Chain 6 ft.		A. Wt. Chain 9 ft. 6 in.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
4	6.57	6.57	6.15	6.15	5.14	5.14
8	20.42	13.85	19.38	13.23	18.22	13.08
12	37.60	17.18	36.55	17.17	36.27	18.05
16	57.08	19.48	55.70	19.15	55.98	19.71
20	77.43	20.35	75.83	20.13	76.48	20.50
24	98.58	21.15	96.60	20.77	97.55	21.07
28	109.25	10.67	107.19	20.59	108.23	10.68
30	120.05	10.80	117.97	10.78	118.96	10.73
32	130.95	10.90	128.87	10.90	129.95	10.99
34	141.91	11.00*	139.55	10.68*	140.80	10.85*
36	152.97	11.02	150.48	10.93	151.79	10.99
38	163.92	10.95	161.34	10.86	162.60	10.81
		3)32.97		32.47		32.65
		2)10.99		10.8233		10.8833
		5.4950		5.4116		5.4416
		5.4116				
		5.4416				
		3)16.3482				
		5.4494 Velocity with a Motive Weight of 24 lbs.				

MONDAY, October 1, 1798.

New Conductor, broad bar, and body a L a, &c.

Thermometer in the Air, 56°.

System Four-fold.

Total Wt. 146 lbs.			Motive Wt. 36 lbs.	
Accel. Wt. Chain	ft. 11	in. 6	A. Wt. Chain	ft. 11 in. 6
Sec.	Feet.	Differences.	Feet.	Differences.
2	2.12	2.12	3.10	3.10
4	7.45	5.33	9.29	6.19
6	15.45	8.00	18.03	8.74
8	25.38	9.93	28.37	10.34
10	36.52	11.14	39.60	11.23
12	48.11	11.59	51.29	11.69
14	60.21	12.10	63.28	11.99
16	72.31	12.10	75.51	12.23
18	84.60	12.29	87.80	12.29
20	97.00	12.40	100.20	12.40
22	109.70	12.70	112.89	12.69
24	122.28	12.58	125.60	12.71
26	135.08	12.80*	138.39	12.79*
28	147.80	12.72	151.22	12.83
30	160.76	12.96	164.00	12.78
		3)38.48		38.40
		2)12.8266		12.80
		6.4133		6.40
		6.4000		
		2)12.8133		
		6.4066	Velocity with a Motive Weight of 36 lbs.	

MONDAY, October 1, 1798.

New Conductor, broad bar, and body a L a, &c.

System Four-fold.

Total Weight 195 lbs. 4 oz. Motive Weight 48 lbs.						
Accel. Wt. Chain ft. 11 in. 6			A.Wt. Chain ft. 11 in. 6		A. Wt. Chain ft. 11 in. 6	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	5.40	5.40	3.86	3.86	3.62	3.62
4	14.11	8.71	11.30	7.44	10.89	7.27
6	25.42	11.31	21.44	10.14	21.00	10.11
8	37.85	12.43	33.63	12.19	32.93	11.93
10	51.30	12.45	46.51	12.88	45.80	12.87
12	64.96	13.66	60.02	13.51	59.29	13.49
14	79.00	14.04	73.89	13.87	73.27	13.98
16	93.20	14.20	88.01	14.12	87.24	13.97
18	107.48	14.28	102.19	14.18	101.51†	14.26
20	121.90	14.42	116.47	14.28	115.90	14.40
22	136.54	14.64*	130.82	14.35*	130.31	14.41*
24	151.10	14.56	145.30	14.48	144.68	14.37
26	165.63	14.53	159.73	14.43	159.27	14.59
		3)43.73		43.26		43.37
		2)14.5766		14.42		14.4566
		7.2883		7.21		7.2283
		7.2100				
		7.2283				
		3)21.7266				
		7.2422 Velocity with a Motive Weight of 48 lbs.				

† Query 101.50?

MONDAY, October 1, 1798.

New Conductor, broad bar, and body a L a, &c.

System Four-fold.

Total Weight 244 lbs. Motive Weight 60 lbs.						
Accel. Wt. Chain 10 ft. 6 in.			A. Wt. Chain 10 ft. 6 in.		A. Wt. Chain 10 ft. 6 in.	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.89	3.89	5.80	5.80	2.04	2.04
4	11.93	8.04	15.33	9.53	8.59	6.55
6	23.27	11.34	27.66	12.33	18.90	10.31
8	36.50	13.23	41.39	13.73	31.51	12.61
10	50.60	14.10	56.10	14.71	45.43	13.92
12	65.79	15.19	71.23	15.13	60.13	14.70
14	80.93	15.14	86.80	15.57	75.39	15.26
16	96.60	15.67	102.51	15.71	90.77	15.38
18	112.34	15.74	118.57	16.06	106.71	15.94
20	128.26	15.92*	134.41	15.84*	122.56	15.85*
22	144.29	16.03	150.42	16.01	138.51	15.95
24	160.03	15.74	166.39	15.97	154.58	16.07
		3)47.69		47.82		47.87
		2)15.8966		15.94		15.9566
		7.9483		7.97		7.9783
		7.9700				
		7.9783				
		3)23.8966				
		7.9655 Velocity with a Motive Weight of 60 lbs.				

MONDAY, October 1, 1798.

New Conductor, broad bar, and body a L a, &c.

System Four-fold.

Total Weight 395 lbs. Motive Weight 96 lbs.						
Accel. Wt. Chain ft. 11 in. 6			A. Wt. Chain ft. 12		A. Wt. Chain ft. 12	
Sec.	Feet.	Differences.	Feet.	Differences.	Feet.	Differences.
2	3.00	3.00	2.00	2.00	5.29	5.29
4	12.73	9.72†	10.82	8.82	16.70	11.41
6	27.02	14.29	24.58	13.76	32.30	15.60
8	43.88	16.86	41.41	16.83	50.20	17.90
10	62.18	18.30	59.68	18.27	68.53	18.33
12	80.97	18.79	78.53	18.85	87.58	19.05
14	99.98	19.01	97.86	19.33	107.20	19.62
16	119.63	19.65	117.40	19.54	126.74	19.54
18	139.12	19.49*	137.10	19.70*	146.51	19.77*
20	159.20	20.08	156.90	19.80	166.37	19.86
		2)39.57		39.50		39.63
		2)19.785		19.75		19.815
		9.8925		9.875		9.9075
		9.8750				
		9.9075				
		3)29.6750				
		9.8916 Velocity with a Motive Weight of 96 lbs.				

† Query 9.73?

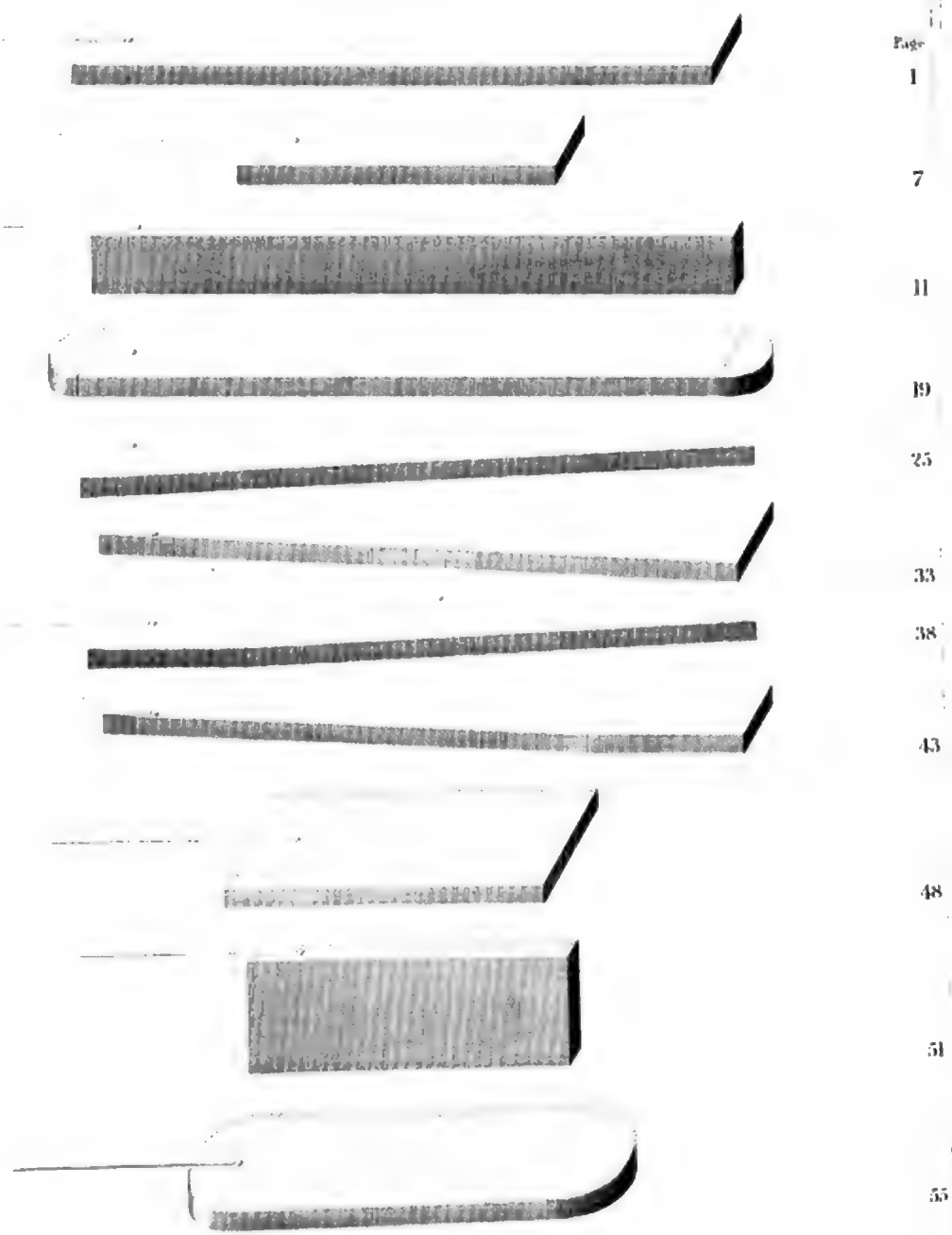
GENERAL TABLE, 1798.

	Page.	Feet per Second.												
		1	2	3	4	5	6	7	8	9	10	11	12	13.527
New Conductor, Broad Bar.	482	0.3613	1.7778	4.5151	8.7473	14.609	22.215	31.662	43.038	56.423	71.884	89.493	109.31	143.97
Long Friction Plank	487	0.8935	3.8659	9.1071	16.728	26.806	39.404	54.579	72.374	92.829	115.98	141.86	170.50	219.64
Short Friction Plank	499	0.7300	3.2126	7.6460	14.146	22.797	33.666	46.812	62.282	80.124	100.37	123.07	148.24	191.51
Friction on 46 feet	487	0.1635	0.6533	1.4611	2.572	4.009	5.738	7.767	10.092	12.705	15.61	18.79	22.26	28.13
.....A o	509	0.2937	1.1616	2.5584	4.4420	6.776	9.524	12.657	16.145	19.958	24.075	28.470	33.110	40.63
.....A a	514	0.2517	1.0237	2.2996	4.056	6.273	8.930	12.004	15.779*	19.336	23.559	28.13	33.03	41.10
.....A b	521	0.2219	0.9258	2.1160	3.785	5.925	8.521	11.568	15.054	18.967	23.297	28.040	33.170	41.75
.....A c	526	0.4003	1.5104	3.2214	5.4500	8.127	11.188	14.581	18.259	22.169	26.276	30.54	34.91	41.73
.....A d	532	0.3096	1.2277	2.7108	4.719	7.213	10.159	13.527	17.287	21.410	25.875	30.66	35.73	43.97
.....A e	537	0.3116	1.2581	2.8142	4.952	7.640	10.844	14.556	18.763	23.411	28.50	34.00	39.89	49.61
.....A f	543	0.4817	1.9042	4.2072	7.336	11.241	15.882	21.218	27.210	33.823	41.03	48.80	57.10	70.72
.....A g	549	0.4191	1.6376	3.5865	6.206	9.444	13.254	17.596	22.428	27.712	33.42	39.52	45.98	56.45
.....A h	555	0.3054	1.2544	2.8394	5.043	7.847	11.232	15.180	19.678	24.702	30.25	36.29	42.81	53.66
.....A i	563	0.3988	1.5896	3.5285	6.173	9.485	13.428	17.967	23.074	28.717	34.88	41.52	48.62	60.29
.....B a	569	0.2229	0.9245	2.1042	3.751	5.856	8.403	11.381	14.777	18.577	22.776	27.36	32.31	40.56
.....C a	574	0.3287	1.2712	2.7565	4.726	7.128	9.917	13.052	16.498	20.213	24.172	28.34	32.69	39.59
.....D a	580	0.2845	1.1348	2.5147	4.389	6.724	9.488	12.657	16.202	19.927	24.111	28.59	33.35	41.11
.....E a	586	0.2836	1.1392	2.5434	4.462	6.867	9.730	13.030	16.741	20.828	25.296	30.11	35.25	43.69
.....F a	592	0.3798	1.4949	3.2870	5.705	8.703	12.238	16.275	20.779	25.712	31.06	36.77	42.83	52.68
.....G a	598	0.2617	1.0539	2.3457	4.107	6.309	8.927	11.935	15.310	19.028	23.073	27.42	32.05	39.64
.....H a	603	0.2698	1.1069	2.5026	4.440	6.900	9.867	13.321	17.244	21.622	26.442	31.69	37.34	46.72
.....H o	610	0.2706	1.1089	2.5050	4.441	6.898	9.857	13.300	17.210	21.569	26.373	31.59	37.21	46.54
.....I a	617	0.9580	3.8075	8.476	14.897	23.016	32.779	44.144	57.06	71.49	87.40	104.76	123.52	154.81
.....I o	628	0.9375	3.7422	8.354	14.715	22.771	32.482	43.797	56.679	71.09	87.00	104.37	123.16	154.54
.....H i	635	0.4156	1.6525	3.662	6.398	9.818	13.886	18.567	23.826	29.633	35.97	42.79	50.08	62.04
.....I h	642	1.0474	4.1833	9.345	16.476	25.524	36.438	49.179	63.70	79.97	97.95	117.60	138.90	174.54†
.....H	650	0.3406	1.3965	3.1586	5.608	8.723	12.486	16.874	21.873	27.461	33.63	40.35	47.61	59.61‡
.....L	657	1.0067	4.1364	9.411	16.821	26.353	37.988	51.709	67.50	85.34	105.21	127.08	150.96	197.81
.....a L	665	0.2332	1.0069	2.3564	4.296	6.833	9.972	13.711	18.055	22.999	28.55	34.70	41.45	52.89
.....L a	673	0.8883	3.6567	8.326	14.888	23.329	33.630	45.778	59.75	75.54	93.12	112.46	133.57	169.15
.....a La.....	681	0.1439	0.6781	1.6781	3.191	5.252	7.889	11.128	14.990	19.493	24.657	30.50	37.02	48.42

* Query 15.479? † Query 174.50? ‡ Query 59.71?

185781

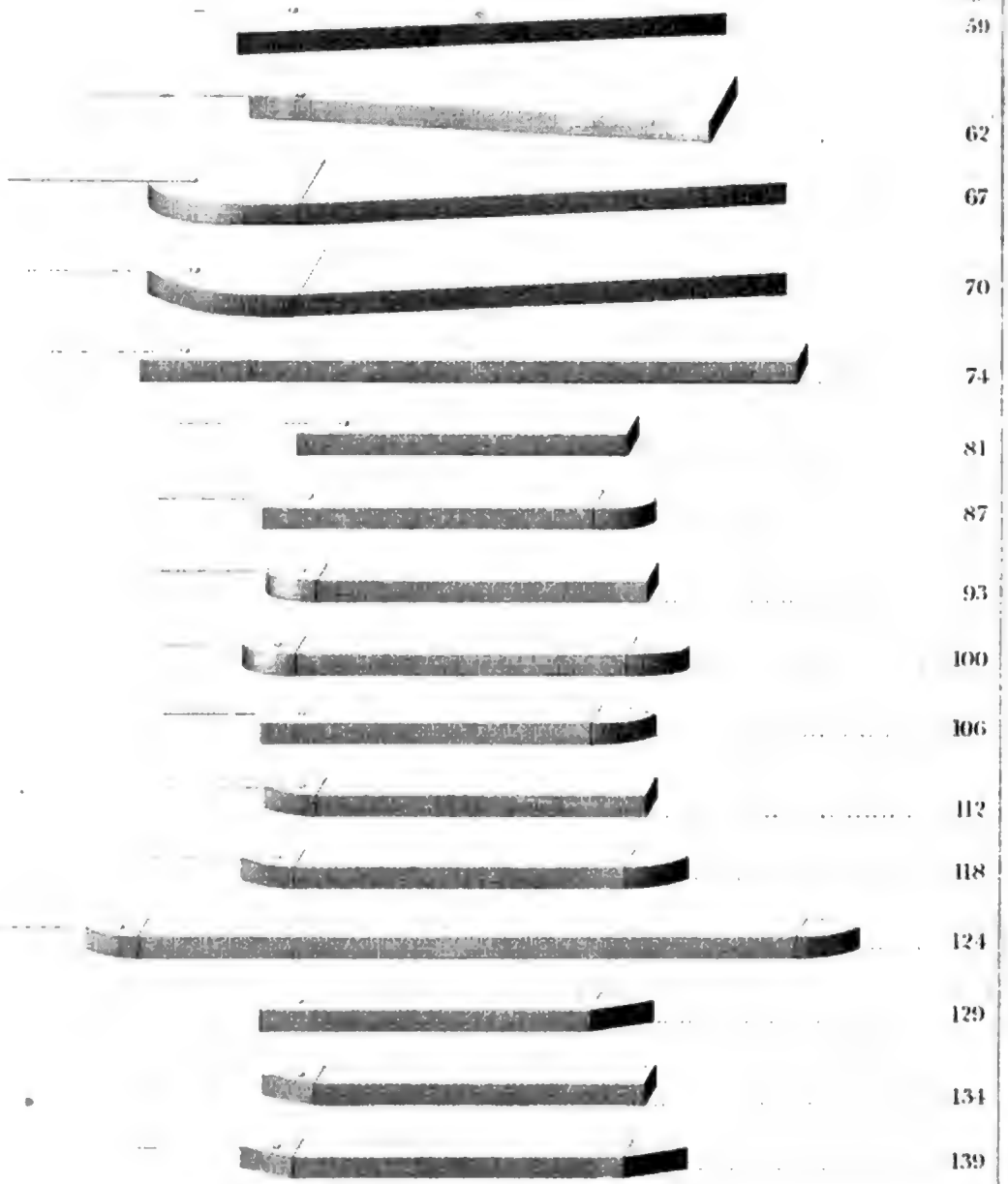
INDEX.



Page
1
7
11
19
25
33
38
43
48
51
55

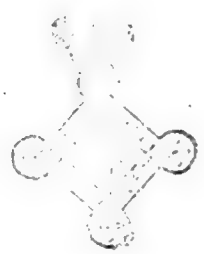
Scale ½ inch per foot.

Digitized by Google

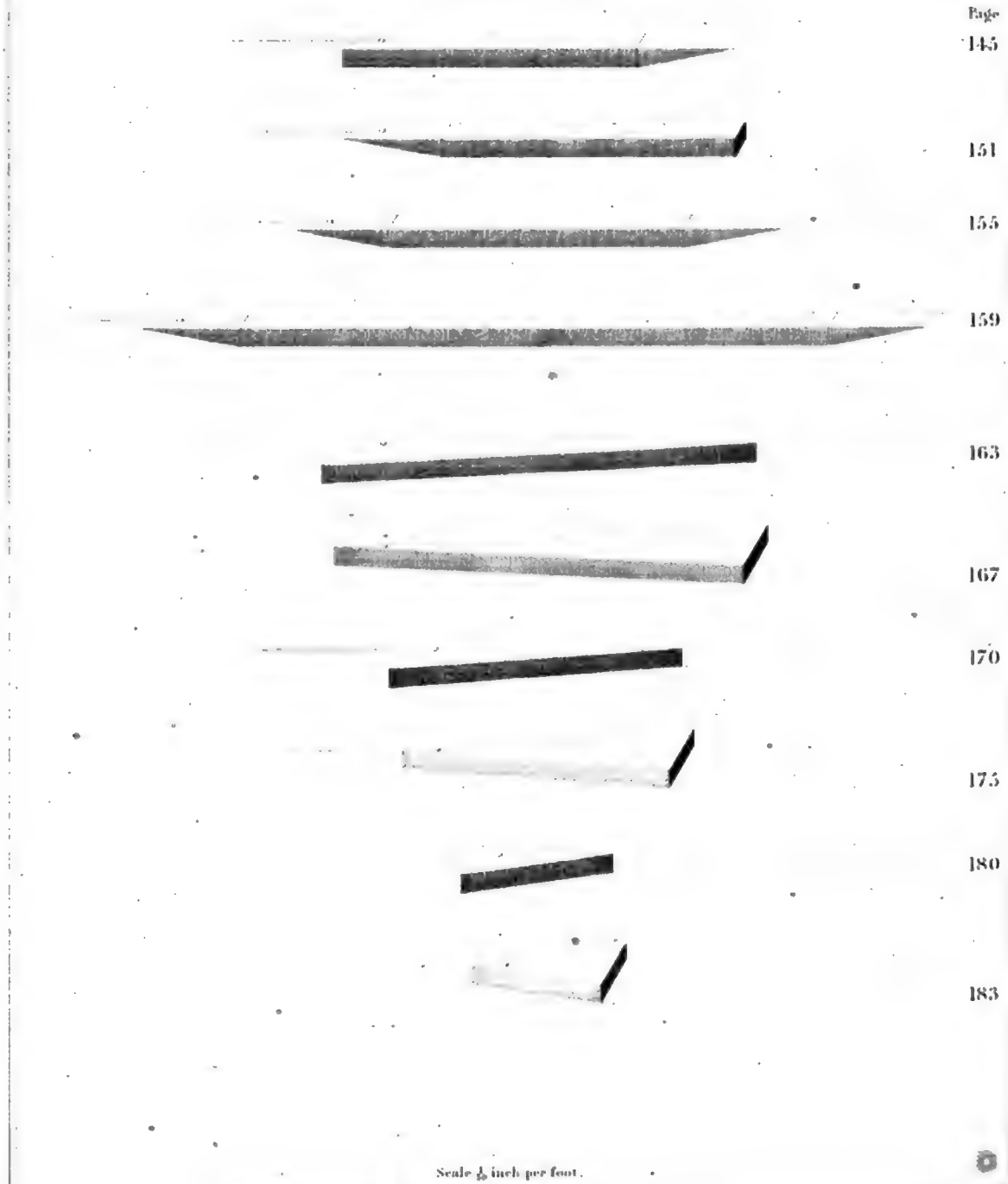


Page
59
62
67
70
74
81
87
93
100
106
112
118
124
129
134
139

Scale $\frac{1}{4}$ inch per foot.

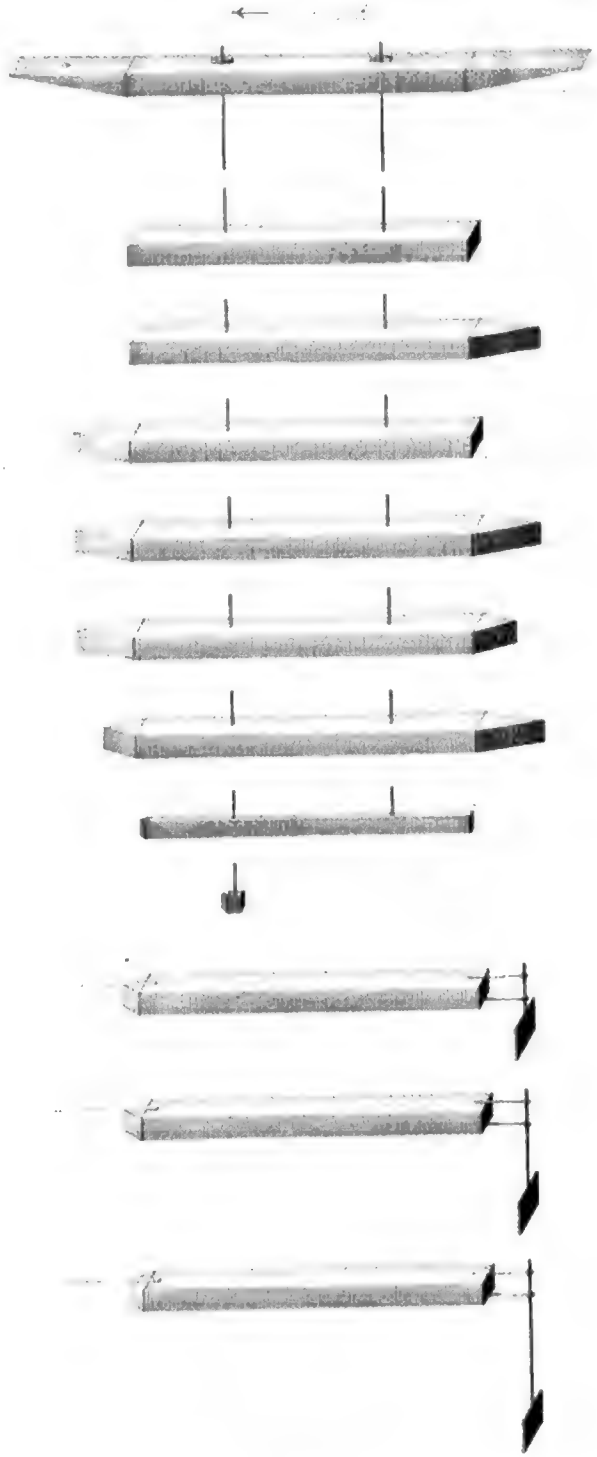


Digitized by Google



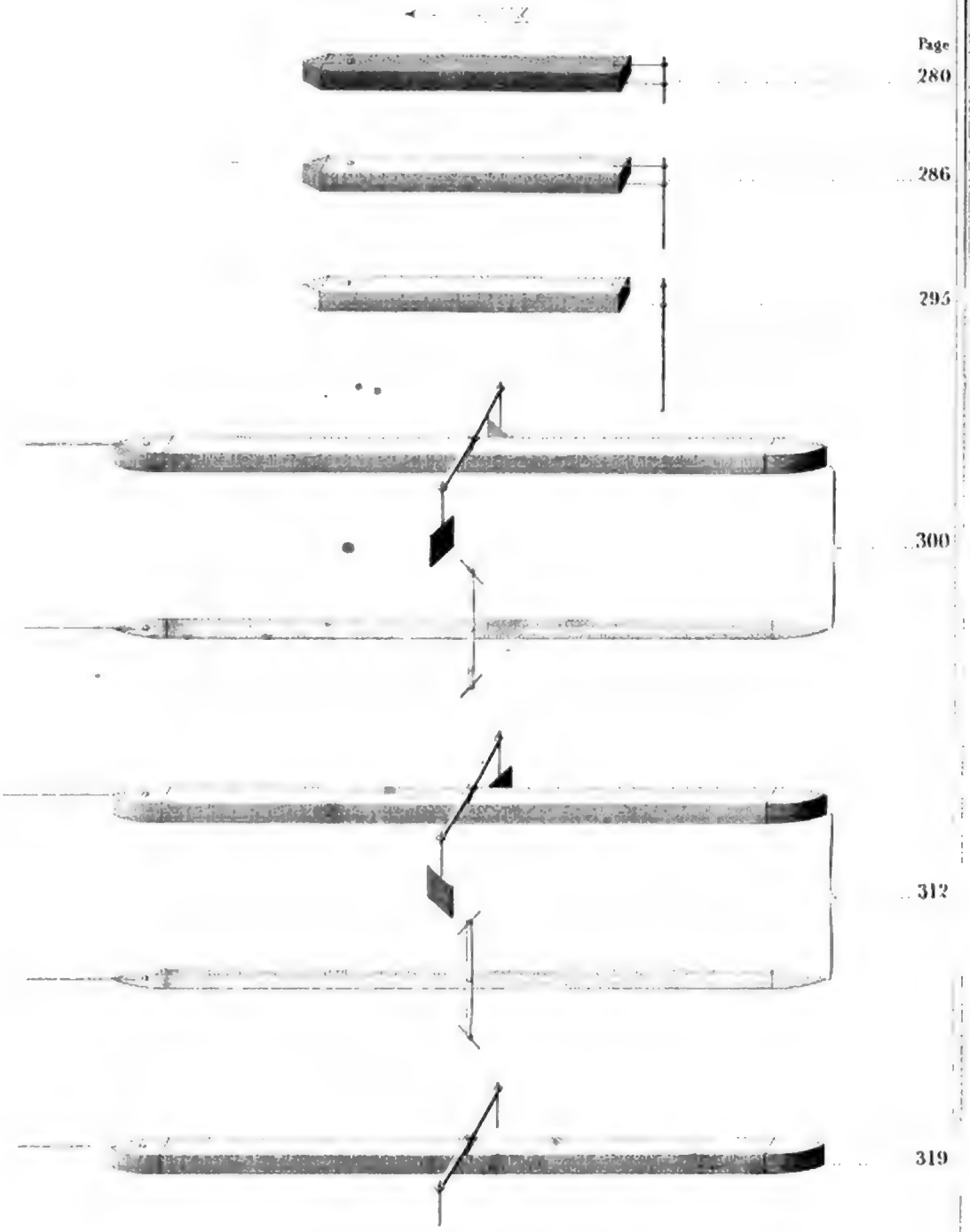
Scale $\frac{1}{8}$ inch per foot.

Digitized by Google



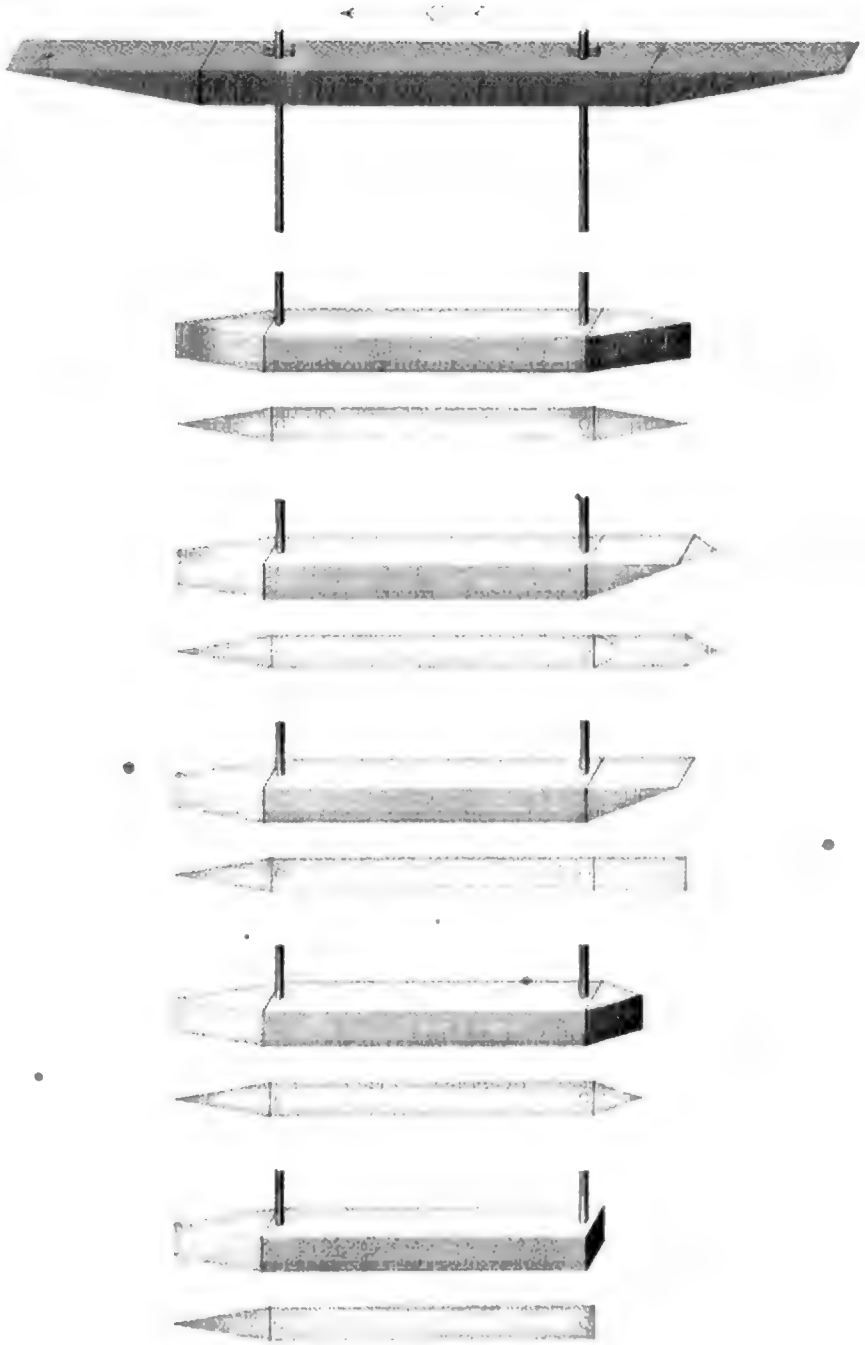
Page
231
187
192
201
209
217
225
239
245
252
258
267

Scale $\frac{1}{16}$ inch per foot



Scale $\frac{1}{16}$ inch per foot.

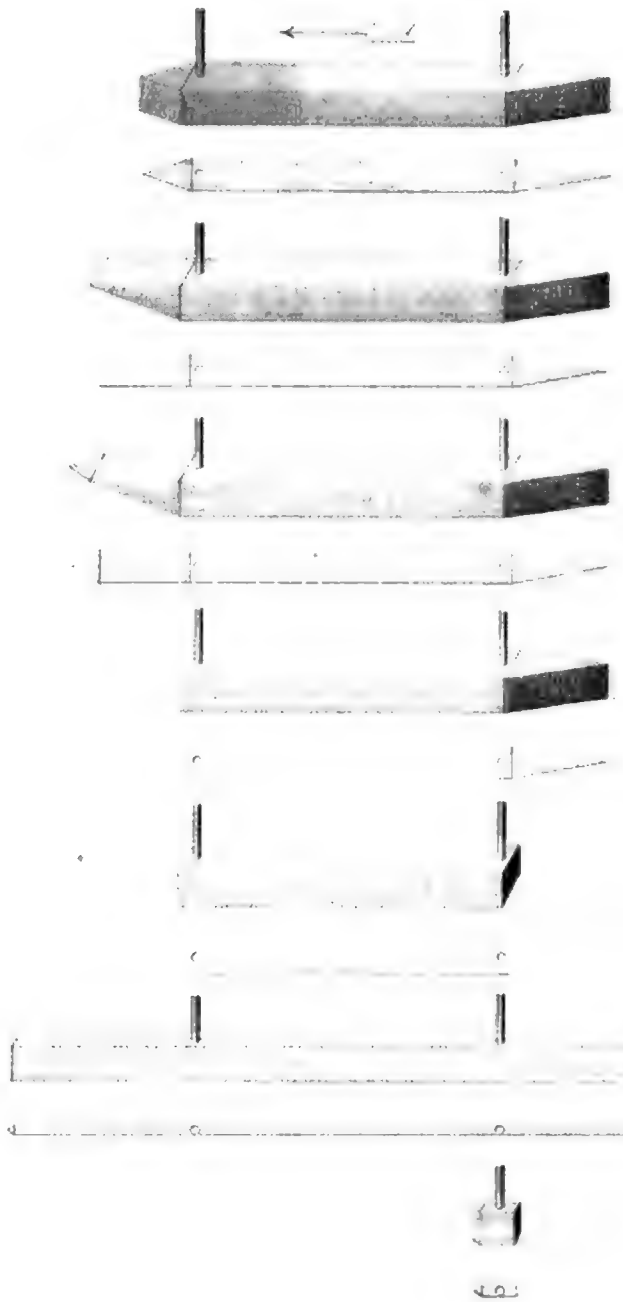
Digitized by Google



Page
325
334
342
345
349
356

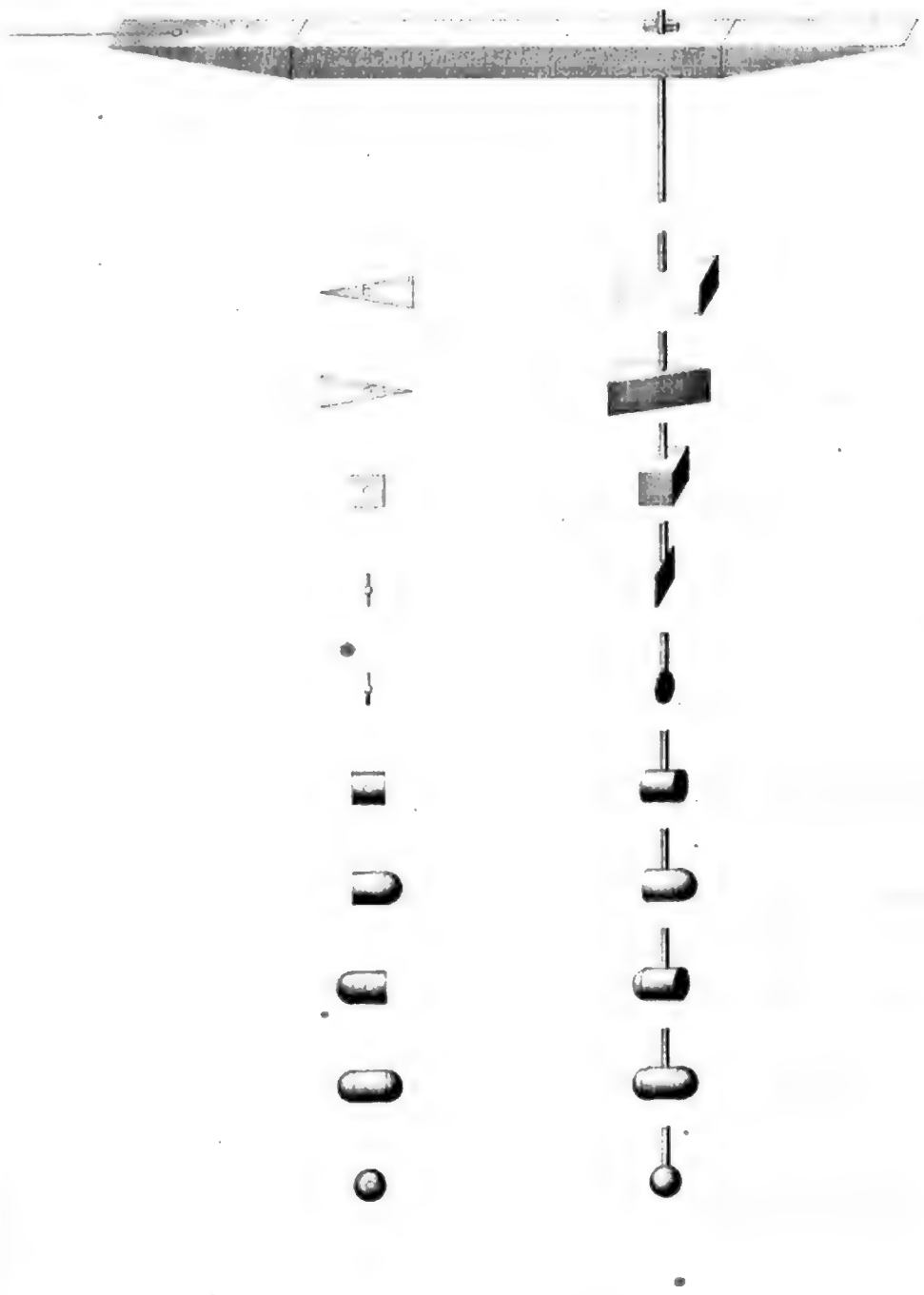
Scale $\frac{1}{16}$ inch per foot.

Digitized by Google



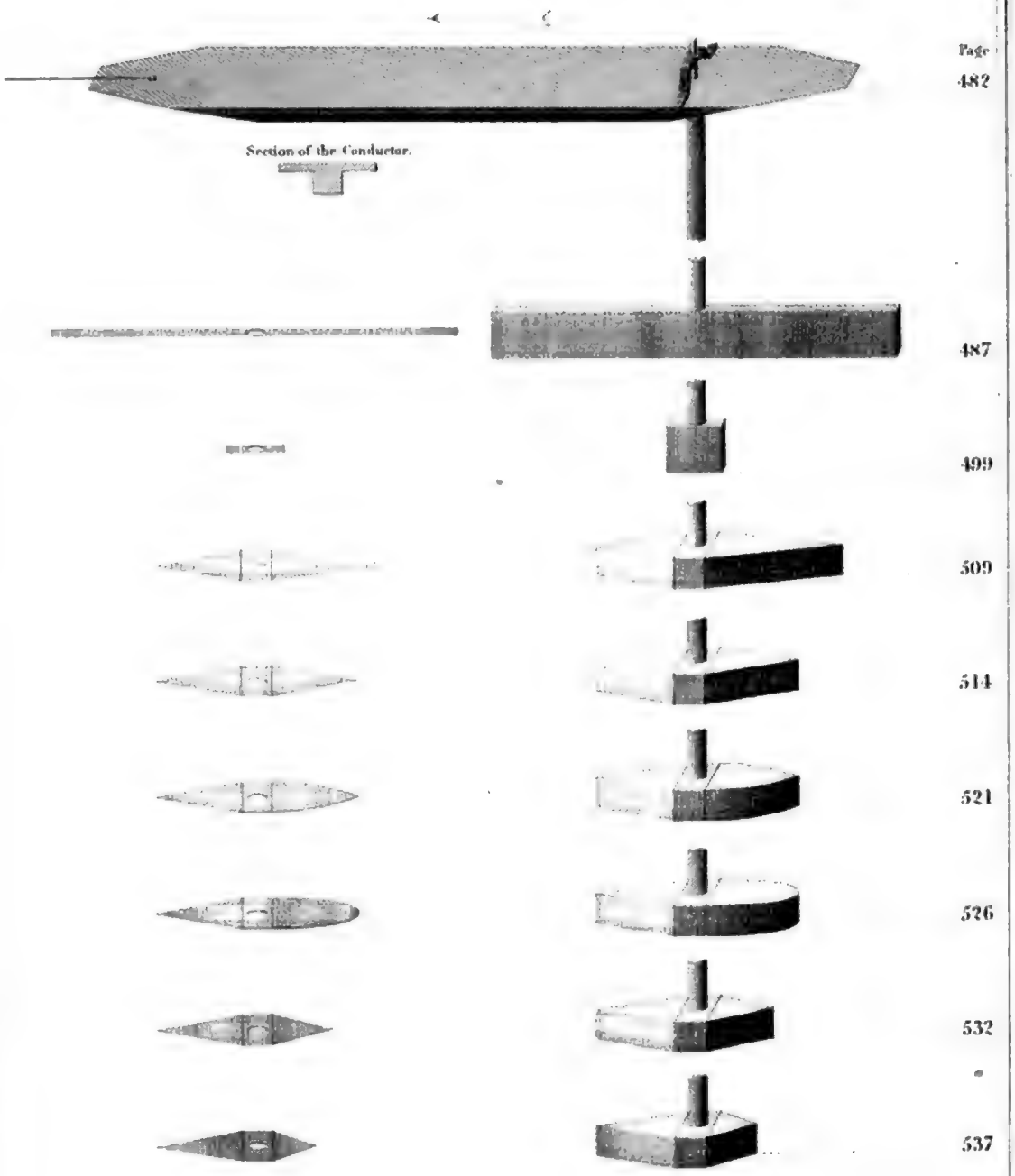
Page
361
371
376
381
392
397
405

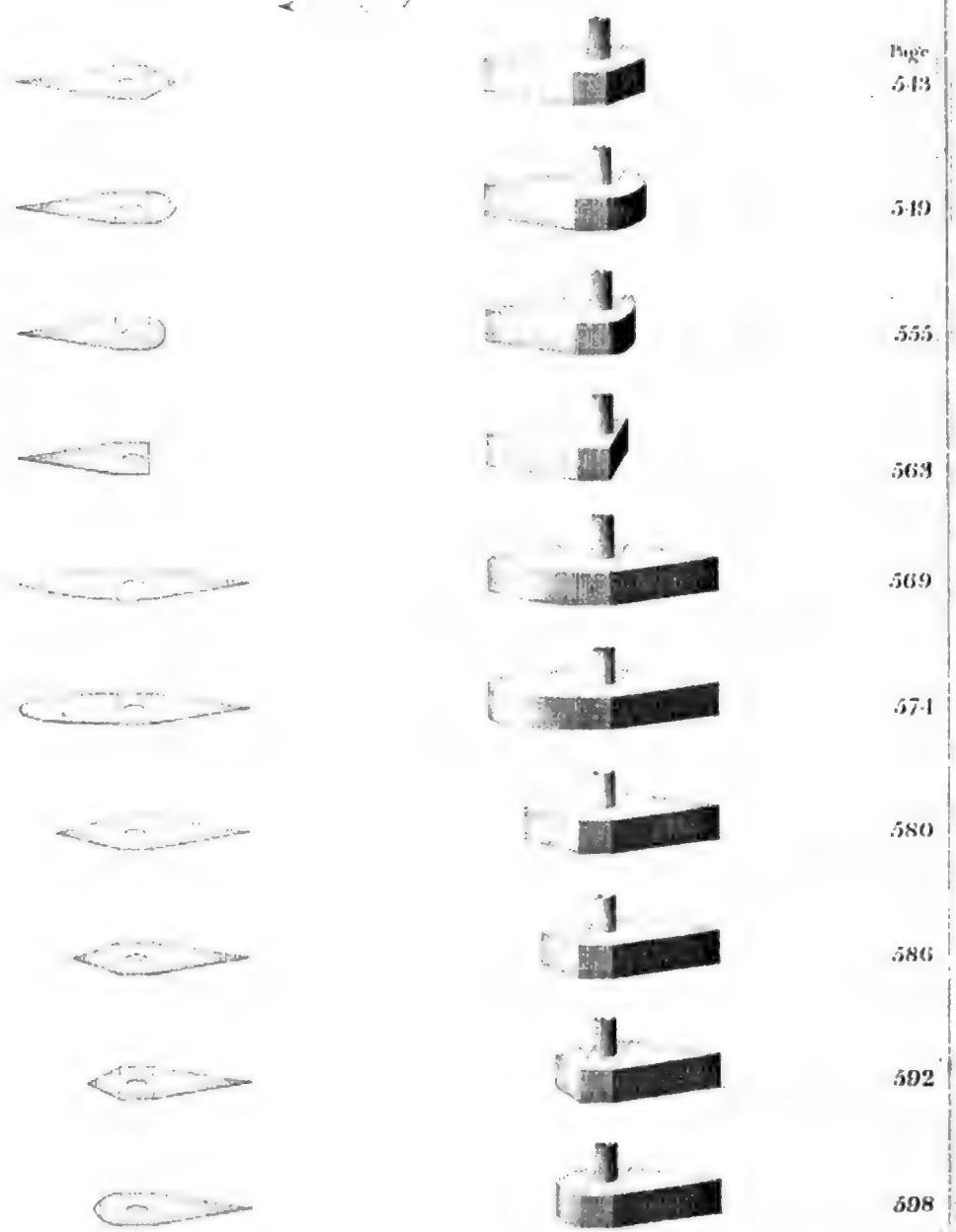
Scale $\frac{3}{4}$ inch per foot.



Page
413
421
425
430
437
445
452
459
463
468
471

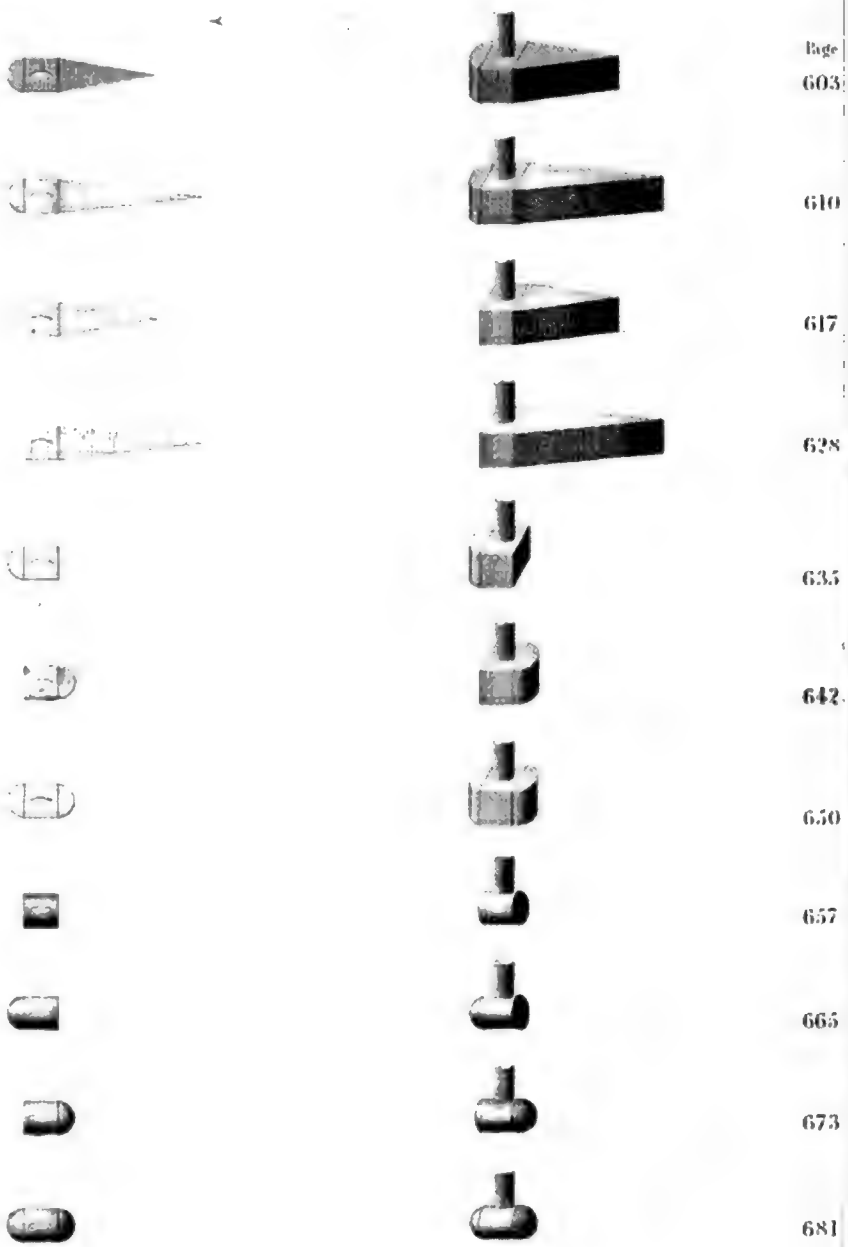
Scale $\frac{3}{4}$ inch per foot.


Page
482
Section of the Conductor.
487
499
509
514
521
526
532
537
Scale $\frac{1}{16}$ inch per foot.



Page
543
549
555
563
569
574
580
586
592
598

Scale $\frac{3}{16}$ inch per foot



Page
603
610
617
628
635
642
650
657
665
673
681

Scale $\frac{1}{8}$ inch per foot.

END OF THE FIRST VOLUME.

NAG
155,781

Digitized by Google

Digitized by Google